

Railway Age

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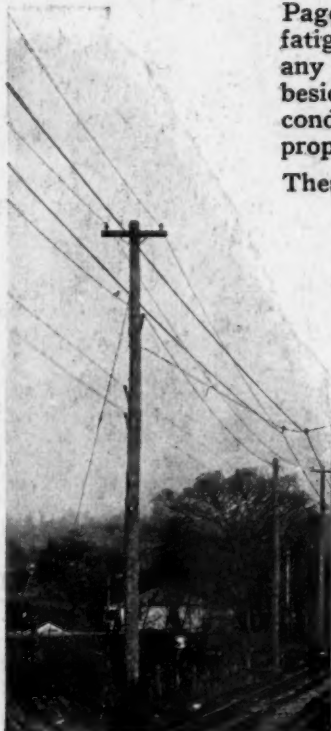


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EDITORIAL

Railway Age

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This paper for many years has advocated the abolition of complicated train orders (often, perhaps usually, made more complicated by very poor penmanship);

Proper Punctuation

of

Train Orders

that is to say, it has advocated the use of the complete block system, which makes written train orders unnecessary, except in emergencies. In spite of this thousands of 19 and 31 orders are issued every day, and the long-standing veneration in which the American train-dispatching system is held continues unabated in a multitude of offices. This being so, we once more call attention to the fact that each subject in a train order ought to be put into a separate paragraph. A recent collision at Toltec, New Mexico, is reported in another column. The misreading of that train order was, no doubt, due to the lack of a suitable separation after the twelfth word, "Osier." That will be the excuse of the men who blundered in reading. Mistakes of this nature *are not rare*. To write orders properly would in many cases require larger blanks. That, perhaps, is one reason why this improvement remains neglected. If beginning each item of an order on a new line would be too much of a jar to settled habits, perhaps a useful lesson might be learned from the innovation which the machine telegraphers have recently adopted—the insertion of the word "stop" wherever a period ought to appear. It is too bad to go on killing people for lack of so simple a precaution.

The monthly figures of railway revenues and expenses which the Class I railroads render to the Interstate Commerce Commission are made public

Monthly Earnings Reports

through their being made available to the press by the commission. A considerable number of the carriers also furnish the press direct with copies of the statements filed with the commission or with statements compiled in a similar manner. Presumably there remains but little doubt as to the value of the monthly statements. There is some criticism of the requirement which calls for the filing of the monthly figures, but it would appear that this is minority and not majority opinion. The value which is admitted to exist in the reports is that the figures in total for all the roads enable the commission, the railway men and the public to check up promptly on railway progress. Monthly figures of railway gross and net serve a variety of useful purposes and are of sufficient use that they are regarded as a very necessary part of business statistical information. The primary value of the figures for the individual roads—as distinguished from the figures of all the roads in total—would seem to lie in the necessity for one railroad to compare its own results with those of its neighbors, and in the necessity for the investor in railway securities to keep himself informed as adequately as he can concerning the property in which he is interested. The reports, therefore, should be adequate, and should be given a fairly wide circulation. A question that arises is: Are they adequate? Unfortunately they seem to lack that quality to a certain extent. The figures in the reports to the commission show their final results in item 24—"Net railway operating income" or "Net after rentals." The lack of adequacy exists because there does not seem as yet to be a

complete understanding of the meaning of these expressions. The monthly reports of the carriers will attain a much greater usefulness when people—railway men, investors and others interested—secure a better understanding of what the commission means when it uses these expressions, when the carriers come to a more universal use of the figure embodied in them, and when, in general, there is a more consistent use of the expressions than there is at present. There is room for much improvement in this regard.

Whenever shortage of equipment imposes on the railroads the necessity for a maximum utilization of the available cars,

Everybody's Business Is Nobody's

various measures are called to mind which would encourage, if not actually require, the shippers to load cars to capacity. Among the suggestions offered are increases in the minimum carload, a sliding scale of tariffs favorable to loadings in excess of the minimums and provision for a larger diversity of mixed carloads. But any efforts to obtain relief from this source in a time of stress are much like attempting to repair the roof during a shower—by the time one can borrow a ladder the storm will be over. In short, this is no time to look for outside help; the roads must work with the tools at hand and the most effective tool in this case is the station agent. But unless he takes a sincere interest in the subject, unless he is made to feel that it is a real part of his job, little will be accomplished. Some form of organization must be set up, not only to bring the necessity of increased car loadings to the agent's attention, but to point out to him how he *can* help and institute a follow-up system to see that he *does* help. The form of this organization, the character of its personnel, is in large measure immaterial. It will vary necessarily with the individual roads and the particular divisions. The important thing is to see that it is somebody's business to follow the thing through.

The British public is clamoring for reductions in passenger fares and it appears likely that the railways will soon grant

Rate Reductions in Britain

some concessions in this direction. Passenger fares now stand at 75 per cent above the pre-war level and it is proposed that 25 per cent of this increase be removed, leaving the rates 50 per cent above the pre-war level. This proposed reduction is a serious matter for the British railways, because passenger traffic is relatively of much greater importance in that country than in the United States. In 1921, for example, 49 per cent of the operating revenues of British railways were derived from passenger train services, whereas passenger traffic contributes only about 25 per cent of the operating revenues of American railways. The railways of the United Kingdom paid 4.35 per cent on invested capital in 1921, but this was possible only because of compensation by the government; otherwise the railways would have faced a deficit. It is difficult to see just how they are going to meet the falling off in their revenues which reduced passenger fares will occasion. The traveling public in England is not apparently any more

concerned with this side of the question than are the shippers in this country who are continually seeking rate reductions on their products. When the national productive process is out of adjustment and groups of producers, powerful politically or economically, find that they are not making their customary profits, they always find the railways conveniently situated to assume their losses for them. In England, as in this country, these groups shift their burdens to the railways, giving no thought to the plain fact that such action must, in the long run, deprive them of the normal expansion of transportation facilities which the growth of industry and population demands.

Starting with the co-operation of the railways as an aid to the farmer in bringing his produce to the rails for shipment,

**It Depends Upon
Whose Ox
Is Being Gored**

the construction of hard surface roads has developed until they are today making serious inroads on the earnings of many railway lines. Apparently oblivious and indifferent to this effect on the railways, many communities and individuals are fostering truck competition in every possible way. In doing so few have considered the possibility of the curtailing of railway service made necessary by these inroads on earnings and the effect of such curtailment on their individual interests. Not long ago a highway was built parallel to the main line of a road across a western state. Upon its completion the motor truck and the motor bus appeared in numbers to compete for freight and passenger traffic. This development was encouraged by a leading newspaper in that state with a large rural circulation. This competition soon made such inroads on the local passenger business of the railway that it was forced to withdraw an afternoon local train which had long carried this newspaper to the northern counties. Confronted with the loss of this circulation, which had been developed at large expense, the publisher at once appealed to the railway management for the restoration of this train on the ground that it would mean large financial loss to him. The road replied that it would be willing to restore this train if the publisher would make good the deficit in its operation occasioned by the competition of the motor trucks. This he could not afford to do. Confronted as he was in this way with the results of the campaign he had fostered, he was not slow to see the ultimate interest of the public in a new light, and his paper is now as staunch an advocate of the regulation of motor traffic to restrict it to its legitimate channels as it was formerly for unrestricted competition at the expense of the railways and the tax payers!

Does a true sportsman buy his guns, fishing tackle and golf clubs from a mail order house simply because he can get the whole outfit at a relatively low price?

**Lump Buying
of
Machine Tools**

Undoubtedly he does not. He is looking for service, and is willing to pay a little more for the privilege of selecting the gun, casting rod, or club which best suits his individual needs. A railroad shop machine tool is also an investment, and first cost is entirely secondary to the amount and kind of service rendered. With the present keen competition in the machine tool industry, price is a pretty accurate measure of serviceability and when it is considered that machine tools and shop equipment are used 15 or 20 years, or more, the productive capacity of a tool is far more important than its first cost. The present more or less common practice of placing big shop equipment orders with one large manufacturer or dealer is objectionable on the grounds indicated above. No one dealer represents all the best lines in the country and in order to quote a lump

sum lower than the total aggregate bids, it is evident that he must include some machines not of the first quality. At the risk of being tiresome, the statement is repeated that the sooner railroad shops are operated on a strict business basis, the better it will be for railroad stockholders. No big manufacturer, for example, would consider ordering all his equipment through one dealer, but would require his mechanical men to study each individual job and recommend the specific machines needed to reduce production costs. Those machines would be purchased of the individual manufacturers or dealers as soon as possible and the mechanical men held responsible for reduced shop costs.

The American Railroads and a Centennial

SHALL THE RAILROADS of the United States observe a centennial?

In the issue of the *Railway Age* immediately preceding this, mention was made of an anniversary celebration recently conducted by the Rock Island. As told in that issue, this road, on the 10th of October, three-score-and-ten years to a day since the first train made its trip from Chicago to Joliet, Ill., launched a program of activities, the proportions of which have not been exceeded on railroads in recent years. In commenting on this, the *Railway Age* took occasion to allude to the views it has held and earnestly advanced during the year concerning the importance of ever striving to build up and maintain the good-will of employees, together with the necessity of railroads doing more to "sell" themselves to the public. It referred to this celebration of the Rock Island's seventieth anniversary as a splendid piece of work along these lines. It advanced the thought that a method which had worked so effectively on one road might well be made the subject of consideration on others, and by inference expressed the hope that the railroads would view it in the same light. Passing from the general to the specific, then, consider the question of a railway centennial.

Less than six years remain until the hundredth anniversary of July 4, 1828, when singularly enough, Charles Carroll, better known as Charles Carroll of Carrollton, only living signer of the Declaration of Independence, little catching the full significance of his act, drove home the spike that marked not only the beginning of the Baltimore & Ohio but of American railroads. Only six short years remain to complete a hundred years of American railroad history, a hundred years within which the mileage of the greatest of transportation systems has grown from nothing to 265,000, or more than in all Europe, more than four times that in all Asia, more than ten times that in all Great Britain and which, double-tracked, triple-tracked and more than eight-tracked in places, forms the principal bond between the hundred millions of people with whose prosperity it is inseparably connected. Less than six years remain, in fact, until the rounding out of a period within which, under the impetus of its railroads more than all other agencies combined, this country, initially inconspicuous, has become the most flourishing and prosperous of nations.

A centennial of American railroads then; a celebration of national scope and perhaps even of international interest, representing the combined energies of every American railroad—such, in substance, is the specific question relating to anniversary activities which the *Railway Age* urges all railroads now to consider.

Reviewing the past, when has another topic of railway interest arisen which admits of so universal an appeal? When will so opportune an occasion again present itself for the railroads to engage the attention of the public. Carefully planned, it should accomplish much in renewing that

pride in nearly 2,000,000 co-workers which contributes so much to their contentment; properly supported, it should augment the harmony between railroads which simplifies the working out of mutual problems; and conducted on a sufficiently large scale, it should establish a contact with a great mass of American citizenry which, though but temporary, will mean much to railroads in the future. "There is a tide in the affairs of men," it has been said, "which taken at the flood leads on to fortune." A centennial celebration of American railroads, it cannot be gainsaid, would be an event in a hundred, an opportunity which should not be missed.

Equipment Orders and Freight Business

THE ORDERS the railways have placed thus far this year for locomotives and freight cars show that they are using all available resources to increase their facilities. The number of locomotives which had been ordered to October 15 was 1,792. The average number ordered annually in the 10 years ending with 1921 was 2,118. Thus, orders placed in the first 41 weeks of this year do not equal the annual average orders of the last decade. They do, however, exceed the average number ordered annually in the five years ending with 1921, which was only 1,483.

The number of freight cars ordered to October 15 was 122,953. In only three entire years of the decade ending with 1921 were larger orders placed, namely, in 1912, 1913 and 1916. The average number of freight cars ordered annually in the 10 years ending with 1916 was 106,469, and in the five years ending with 1921 it was 64,619. It will be seen the number ordered already this year exceeds the average annual records of both the last five and the last 10 years.

The new equipment bought will not, of course, result in an equivalent net increase in the amount of equipment in service. The average number of locomotives retired from service annually in the 10 years ending with 1921 was 1,615. This is only 177 less than the total number ordered thus far this year. The average number of freight cars scrapped and retired from service annually in the 10 years ending with 1921 was 76,760. This is only 46,193 less than the total freight cars ordered thus far this year. Because of inability of the railways within recent years to buy a normal amount of new equipment the number of locomotives and cars that ought to be retired is now unusually large.

But two and one-half months of the year 1922 still remained when these statistics regarding the orders placed this year were compiled. Substantial orders are still being placed and probably will continue to be until the end of the year. The total orders placed in 1922 will hardly approach those placed in such years as 1916 and 1912, but they promise substantially to exceed the averages of the last 10 years. They will provide for a normal year's net increase in equipment, but will hardly make up for any of the large deficiency in equipment which has accrued within recent years.

The comparatively large orders for locomotives and cars being placed evidently are predicted on the belief of railway managers that traffic will continue to move in increasing volume. Statistics regarding the amounts of various classes of commodities being shipped seem to support this view.

In the fall of 1920 the railways handled the largest business that they ever did in their history. The total number of cars loaded with freight in the four weeks ending with October 14, 1922, was only 2.9 per cent less than the number loaded in the corresponding weeks of 1920, but there are wide differences in the tonnages of the various classes of commodities handled in the two periods. Study of these

differences may suggest what future tendencies are likely to be.

Many people believe that the reason why the railways are now handling such a large volume of freight is that the coal strike has forced upon them an abnormal tonnage of coal and that therefore the present excess in the demand for transportation over the supply will be temporary. The fact is that in the four weeks of 1922 mentioned the number of carloads of coal moved was 13 per cent less than in the same weeks of 1920. Furthermore, shipments of ore were 39 per cent less, of forest products 5 per cent less, and of coke 39 per cent less. How, then, was it that the total shipments were only three per cent less?

Shipments of grain and grain products were $21\frac{1}{2}$ per cent larger than in 1920; of livestock $15\frac{1}{2}$ per cent larger and of less-than-carload merchandise 11 per cent larger.

The farmer is sending his crops to market and getting his money for them as fast as he can. He was holding his crops back in 1920 and not getting his money for them. In view of these facts, is he not likely to be a larger purchaser in 1923 than he was in 1921?

Shipments of L.C.L. merchandise thus far this year have been much greater than ever before. They consist chiefly of finished products. Retail merchants must have been buying them from wholesale merchants, and they from manufacturers, in large amounts or they would not have been shipped in record-breaking volume. Since this has been the case, does it not seem probable that there will be activity in general manufacturing for months to come. When there is activity in manufacturing there is a large demand for fuel and raw materials. Those engaged in the construction business say there is prospect of a great deal of construction work. Do these things not indicate the prospect of increase in shipments of the classes of commodities which are not now moving in as large volume as two years ago?

Apparently it can be assumed that there will not be a demand for transportation which will equal or exceed all past records only upon the theory that the demand for the transportation of grain and grain products, livestock and merchandise is going to decline as much as the demand for the transportation of coal and coke, forest products, ore and miscellaneous commodities is going to increase. But is there anything in the situation to indicate that the demand for the transportation of commodities now moving in record-breaking volume is going substantially to decline?

The United States is a growing country. There never was a business depression that was not followed by a business revival which made the demands upon the railways greater than ever before. Unless past experience is misleading, the demands upon the railways in months and years immediately ahead are going to increase, and they will have use for more additional facilities than they will be able to provide.

Consideration of Consolidation Plans

THE CONSOLIDATION provisions of the Transportation Act have as yet secured by no means the amount of attention and discussion which their importance will eventually unquestionably bring forth. This statement is made with due regard to the amount of material which has been written or spoken about the subject but nevertheless the fact holds true that the amount of interest which has been taken in the matter still remains relatively small in proportion to the importance of the question. New England and California, however, are exceptions. In the former, as is aptly pointed out in an article by W. J. Cunningham, James J. Hill, professor of transportation at Harvard University, which appears in the first issue of the new Harvard Business Review, the underlying reason is a realization of the importance of the subject as concerns the future welfare of New England industry. In

California the situation is involved in the Southern Pacific-Central Pacific segregation.

The New England discussion represents presumably the more ordinary manner in which the discussions of the various consolidation plans will be carried on. The California situation has its chief measure of interest in the conflict which has arisen between an old and a new idea in railway regulation—the old idea being that represented in the anti-trust acts and the recent decision of the Supreme Court and the new idea that embodied in the consolidation provisions of the Transportation Act. In addition, of course, there is also involved the corporate relationships between Southern Pacific and Central Pacific; it must be remembered that to separate these two companies would not only take away from the Southern Pacific System its line to Ogden but also remove the connecting link between the lines in Oregon and those in southern California.

The California situation should prove of particular value because of the emphasis it will place on the new theory of railway regulation that consolidations may be of value as distinguished from the former theory that they were essentially bad. The expression of this new theory is the best feature of the entire consolidation idea and it deserves considerably more importance than it has thus far received. In truth, the time seems to be approaching for the formulating of a more practical attitude towards the consolidation plans than the railways thus far seem to have felt it necessary to adopt. They are the ones primarily interested and it seems as if they should evidence that they have a keener appreciation of that fact than they have so far shown.

Union Leadership in America and Britain

IT HAS BEEN SAID that trade unionism in the United States is from 25 to 50 years behind that of Great Britain. This is generally taken to refer to the strength of the trade union movement, i.e., that the unions in this country are no stronger, comparatively speaking—numerically, politically or economically—than the British unions were several decades ago. Without arguing this point pro or con, we should like to suggest another phase of the trade union movement wherein Great Britain is certainly many years ahead of us. This is in its intelligent leadership.

One looks in vain among union leaders in this country for men of the calibre, vision and knowledge of economics which are the characteristics of such leaders of the British railway labor unions as J. H. Thomas, J. Bromley, J. Marchbank and C. T. Cramp. The reason for this condition in all probability lies deep below the surface and it is not necessarily a reflection on leaders of labor in this country to say that, generally speaking, they are not as able and as learned as their British contemporaries. Some American labor leaders, potentially as capable, may be restrained from an exercise of their abilities by a narrow-minded membership. Whatever the cause, however, the statement stands—the leadership of the railway unions in this country, generally speaking, suffers by comparison with that of Great Britain.

The outstanding characteristic of most union struggles in this country has been their predatory nature. Most of them have been designed to gain a greater share in the product of industry at present without any effort at all at increasing that product. Anyone with the most elementary knowledge of economic law should be able to see that a continuing increase in the return which any group can receive for its services can come only by an increase in production. Some increases may be obtained, it is true, by wresting a larger share of present production from other economic groups but

there is a limit beyond which this sort of thing cannot go. When this limit has been reached the only method of securing increased returns is by an increase in efficiency.

The leaders of labor on the British railways quite evidently recognize this fact and they are exerting their best efforts to interest their membership in improving the efficiency of the railways. By pursuing this policy they are not only doing the very best service possible for their own members, but they are making their unions useful to society as a whole.

How much longer will American labor leaders allow it to be truthfully said that unionism in this country is many years behind the movement in Britain?

New Books

The Alaskan Engineering Commission. 124 pages, 6 in. by 9 in., with map of Alaska. Bound in cloth. Published by D. Appleton & Co., New York.

This is No. 4 of a series of service monographs of the United States Government prepared by the Institute for Government Research and is devoted to the development of railroads in Alaska from the first privately-owned road built in 1898 to the government operations through the year 1920. The monographs are prepared according to a uniform plan and this one is no exception. They give the history of the establishment and development of the service; its functions in detail by specific activities; its organization; the character of the plant; a compilation or reference to the laws and regulations governing its operations; financial statements showing its appropriations, expenditures and other data for a period of years; and lastly, a full bibliography of the sources of information, official and private, bearing on the service and its operations.

The Constitution of the United States: Its Sources and Its Application. By Thomas James Norton, assistant general solicitor, the Atchison, Topeka & Santa Fe Railway Company, 298 pages, 5 in. by 7½ in. Bound in cloth. Published by Little, Brown and Company, Boston.

This is not a railway book, of course, but every American citizen should know what it tells. The Constitution of the United States is the most interesting and important document that ever was produced in this country, if not in the entire history of mankind. It is not only the framework of our federal government, but nobody without knowing its provisions can understand our state governments, since the federal Constitution puts limits upon what the state governments can do.

The federal Constitution was long the object of almost unanimous praise, and even adulation, by American public men and writers on political subjects. Within recent years it has been the object of much criticism. Many young and old persons of radical tendencies have learned to depreciate and denounce it on the ground that it is an instrument of tyranny over the "masses." Nine-tenths of those who think and talk thus know almost nothing about the real provisions of the Constitution and even less about what the author of this book calls "its resources and its application."

Mr. Norton's purpose was "to put within the reach of the American citizen and the young people in school a brief but full and live explanation of the sources of the great clauses of the Constitution and also the applications of these clauses in the great cases which have arisen." There has been great need for such a book. There are numerous ponderous volumes about the Constitution. Most of them have been written for lawyers on the assumption that their readers know the provisions of the Constitution. Only students of jurisprudence would read or could understand them. What was

needed was a book which would tell exactly what the Constitution says and which would set forth exactly what its provisions mean and how they apply in language which anybody could understand.

Mr. Norton was admirably equipped to write such a book. He is a successful lawyer of long experience. The study of the Constitution has been almost a life work with him. He was formerly, however, a daily newspaper reporter and writer. In that school he learned how to tell things so that young people and the average man in the street would be interested and would understand. With his unusual experience and great knowledge he has written a book about the Constitution which might well be put in every college and even in every high school. Why should our young people be taught dead languages, history and economics and be allowed to graduate with honors knowing little or nothing about the actual provisions and meaning of the Constitution which is the foundation of our entire government? The book is also one which might well be read by every citizen, for every citizen ought to know what the Constitution of our country really is.

One fault of every book that has heretofore been written on the Constitution is that the Constitution itself has been published either at the front or back and that the history and interpretation and application of its provisions have been given separately in the text. In Mr. Norton's book the various provisions of the Constitution are published in bold face type and run through the entire book, and under each clause quoted from them is given the history, the interpretation and application of this clause. Thus the reader does not have to turn to one part of the book to find what the Constitution says and then to the text to find what is said about it. All through the book references are made to the constitutions of other nations which have copied ours, and to quotations from what great jurists of other countries have said about it.

Mr. Norton has kept out of the book both opinion and propaganda, leaving it to the reader to make his own deductions from the historic facts given. He has, however, written a book which no one who approaches the subject for the first time can read without realizing that much of the criticism of the Constitution and of its interpretation and application by the courts is without justification. The federal Constitution is the bulwark of American liberty and of American institutions. Mr. Norton's book should receive wide reading and use and do great good.

The Canadian Railway Act, 1919, Third Edition. By Angus MacMurchy, K. C., and John D. Spence, barristers-at-law. Toronto, 1922, Canada Law Book Company, Limited.

The second edition of the above work, which was published in 1911, had 80 pages more text and over 400 more decisions than the first edition, which appeared in 1905. About 3,000 cases are cited in the third edition. The first 57 pages of the book are taken up with a comparative statement of the section numbers of The Railway Act, 1919, and amending Acts and the preceding Act as well as with citations of cases. There are 754 pages of text. Readiness of reference is provided for by an index of 43 pages. The present edition has about 100 pages more of text and annotations than the second edition. At the same time, there has been a cutting down in bulk by omitting the Lord's Day Act, the schedule of forms and requirements respecting plans, the regulations of the board, etc., and by adoption of abbreviations in citations wherever possible.

The setting out of the decisions in black faced type in the present edition is an aid to the eye in running down the authorities cited. The text is copiously annotated. Of the total printed text approximately 60 per cent of the space is taken up with annotations. Without attempting to enumerate in detail and simply by way of illustration, it may be noted that of 135 pages of text covering sections 312 to 359 of the

Railway Act—the portion peculiarly concerned with freight and passenger tolls—117 are taken up with annotations. The information, especially in the section dealing with tariffs and tolls is rich in citations from decisions of the United States courts and regulative tribunals. The editors in this connection acknowledge their indebtedness to the chief counsel and the assistant counsel of the Interstate Commerce Commission. While these decisions are informative and in various instances indicate the road, at the same time it is recognized that only when the circumstances in Canada are on all fours with those in the United States can the decisions based on the latter be regarded as applicable in their entirety in Canada. *Manitoba Dairymen's Assn. vs. Dominion and Canadian Express Cos.* 14 C.R.C. 142 at p. 148.

The Canadian Railway Act has developed by accretion and has in form a lack of logic which appertains to such a method of development. It is a code setting out the conditions which, in the absence of express legislation, are to be read with the terms of the Special Act. It sets out the powers of the railway, not only as to the fundamental matter of compulsory taking of land, but also as to the powers in connection with construction and operation. Then, in addition, there is superimposed an extensive regulative jurisdiction extending from the approval of a route map to the sections dealing with tolls. The regulative portions, so far as tolls are concerned, deal primarily with railway tolls. There has not, however, been a development on any rigid logical method. By successive enactments, regulative jurisdiction has been conferred in regard to express, telegraph and telephone tolls. While in respect of railway services there is jurisdiction not only over facilities but also over tolls, the jurisdiction in respect of services set out in the preceding section is a toll jurisdiction alone.

The same lack of thoroughgoing logical organization is apparent when the terms of particular sections are considered. Section 375, sub-section 12, dealing with telephones provides that "The jurisdiction and powers of the Board, and in so far as reasonably applicable and not inconsistent with this section of the Special Act, the provisions of this Act respecting such jurisdiction and powers . . . shall extend and apply to all companies as in this section defined." Such a delegation of law-making power to a tribunal with mingled judicial and administrative functions would give pause to a United States commentator. In dealing with this situation, Parliament has shown that the same laws do not apply to it as those which apply to nature—*Natura non facit saltum*.

Not only those who desire to deal with the railway law of Canada from a technical standpoint but also those who desire from an informational standpoint to obtain an acquaintance with the evolution of Canadian law in regard to railways will find in the text a clear and compendious treatment applying wherever possible the scientific canons of the comparative method. In sum, it is an excellent and convenient work of reference.

S. J. McLEAN,
Assistant Chief Commissioner, Board of Railway Commissioners of Canada,
Ottawa.

Railroad Freight Transportation. By Leonor Fresnel Loree, president of the Delaware & Hudson and chairman of the board of the Kansas City Southern. 734 pages, 6 in. by 9 in. Bound in cloth. Published by D. Appleton & Co., New York.

The question sometimes arises as to whether railway men spend much time reading books. If more railway books like Mr. Loree's new volume were available the amount of book reading by railway men would be increased accordingly.

Whether railway men read many books or not, they do not write very many of them; at least, not nearly as many of them as might be desired. It is not often—at any rate not often enough—that readers of railway literature have the opportunity of reading a book by a railway operating officer and still less one written by a leading railway execu-

tive who at the time he writes is playing a leading role in the subjects with which he deals. As concerns Mr. Loree's book, one might wish that it would serve as a precedent. It is interesting and informative enough to serve as a good precedent.

The "jacket," as the publishers term the paper cover which they put on new books to protect the cloth binding and gold lettering, contains this statement: "This book discusses all that enters into freight transportation. It is the detailed and practical work of a railroad officer who draws upon ripe experience in presenting a thorough analysis of every phase of the subject." Careful perusal of the book leads one to remark that this statement is correct but modest, the latter being a characteristic unusual incidentally for book descriptions written by publishers. First of all, the book discusses many more things than freight transportation; it deals rather with railway activity in all its branches, although it is true that operation of the railway freight service is the feature that is given greatest emphasis. Secondly, the publisher, it would seem in all seriousness, might well have said a word or two more about the qualifications of his author. Mr. Loree is remarkably well fitted to write a book of this kind and his fitness is evidenced well in what he has written. There must be a strong tendency on the part of an author who has attained some standing in public life to say a great deal about himself in whatever he writes. Mr. Loree's place in the railway industry could be considered sufficient cause for him to do this very thing. The temptation, however, has not proved too strong for Mr. Loree to combat. The book, therefore, is in no sense whatever autobiographical. It is about railway operation and the author has used his own wide experience only as a source from which to draw some valuable suggestions about railway operating problems and for some extremely interesting examples to illustrate important points in his text.

In 734 pages an author can deal with many subjects and discuss many things, and that is exactly what Mr. Loree has done. Construction, maintenance-of-way and mechanical matters are all given extensive attention. History—notably the history of the locomotive—comes in for considerable space, as also do accounting, statistics and the various other related subjects. The book, however, deals primarily with operation. There are some extremely interesting analyses of the duties and responsibilities of the various workers in the railway service. One section—Part V, Movement of Cars—deals with such subjects as the distribution of time in a typical car journey, car loading, reconsignment, yard and road handling, per diem, the matter of car repairs, car ownership and the responsibilities of the carrier from the standpoint of car supply. The value of the section, as also the value of the other sections of the book, lies not only in the amount of data given but is perhaps primarily embodied in the practical suggestions made to secure improved results in operation and in consideration of what might be done to induce shippers to use cars as transportation facilities rather than as warehouses.

Part VI, dealing with the Movement of Engines and Trains, discusses such subjects as engine ratings, yard work, operation under the standard code of train rules, etc. Some few pages are devoted to signals, although possibly less than the importance of that subject might well deserve. The last 200 pages of the book are devoted to labor. There are discussed the duties and responsibilities of the train and engine crews, after which there follows a long array of details about relations with labor covering such matters as rates of wages, the labor movement as embodied in the long series of wage demands and arbitrations; there is also an interesting section dealing with some of the large strikes which form an important and interesting part of American railway labor history.

The book attracts because of the amount of interesting data which is included; it will have a real value as a book of

reference, because some of the information given is not readily available anywhere else. If one were to suggest, however, the book's greatest value, it would be the interesting manner in which it is written. It certainly is characterized by its readability, and that is an asset which no one in these days can pass without notice. Nor can one read on without thinking when one comes to such clauses as these:

"In a big terminal the difference in value between a good yardmaster and a poor one may amount to a president's salary. The yardmaster who is competent to handle a difficult situation is not always estimated at his full value."

"I have served in a great variety of positions in the railway service from rodman to president. I have always felt that the most desirable of them all, certainly in the vigor of life, is that of division superintendent. Here one knows personally his subordinate officers and men, their character, disposition and conditions, their ambitions, hopes and fears; he knows the customers of the road, their strength and weakness, prosperity or decline; here he can originate projects and follow them through to completion. Under the divisional organization especially he is more nearly master of the situation and of his own fate than in any other office in the service."

And speaking of station agents:

"I am afraid that employees generally have not sufficiently absorbed the fact that it is the use of the car that is wanted, and not the money involved in the collection of demurrage, so that the effects of their efforts with patrons along this line have been somewhat negligible."

"It used to be said that to educate a locomotive engineman cost the company \$5,000 and Addison Hills, the vice-president of the Lake Shore, told me in 1886, he thought it cost one million dollars to educate a general manager."

A good example, surely, to illustrate the value of the subject under discussion, in this instance, continuity of employment.

It is not necessary nor is it desirable, however, to be laudatory concerning Mr. Loree's book. One cannot suggest that the book is a perfect production. For one thing, it might, one would suggest, have a better arrangement; subjects sometimes appear under what is patently the wrong heading. In a few places they appear to be dropped and later taken up again. There is considerable extraneous matter and in instances digression from the subject in hand. Other subjects seem to be slighted. Electrification of steam railways, notably, is given scant treatment; the matter of the improvement in locomotive and car design in recent years is given rather less attention than the subject may be believed to deserve. Presumably because the book deals with railway operation, Mr. Loree omits discussing such subjects as railway regulation, valuation, etc., in which he must hold a special interest. He would be expected to be at his best in such subjects as these. On second thought this statement may be a bit too strong. He would have to be pretty good, after all, to be better in them than in the subject around which the present book is written—name, operation.

Taking the book by and large, one has no hesitation in recommending it highly. It is a very informative book by an expert in the subject and it is most interesting.

The review would not be complete did it not acknowledge certain statements concerning the *Railway Age* which Mr. Loree has included in a section dealing with the sources of information which are available to the railway man. On page 194 he says:

"In 1917, it was seen that government operation of our railways as a war measure was contemplated by the administration. From that moment the whole force of the paper was trained against the possible added calamity of government ownership; and not until the railways were actually turned back again to their owners to be operated was there any let-up. The publisher does not claim that the *RAILWAY AGE* fought the battle alone; but he does claim that it was the greatest single factor in bringing order out of chaos and in preventing government ownership."

And on page 195:

"It is probably true that no other technical journal in the world is quoted as frequently and fully by the daily newspapers as is the *RAILWAY AGE*—a great tribute to its strength and a considerable factor in molding public opinion."

Letters to the Editor

[The RAILWAY AGE welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]

When and How to Eliminate "Whistle Stops" at Crossings

BALTIMORE, Md.

TO THE EDITOR:

Referring to the letter written by "Quaestor" which appeared in your issue of October 21, 1922; the problem is simple:

- (a) Capitalize the stops at \$1.00 a stop; that will define just what expenditure may be justified to obviate the stops.
- (b) Capitalize a crossing collision.
- (c) Separate the grades and thus provide permanent relief and prevention against accident; such cannot be obtained either by automatic signals or interlocking.

F. P. PATENALL,
Signal Engineer, Baltimore & Ohio.

Get the Employees to Boost

PORTLAND, ME.

TO THE EDITOR:

During the life of the ordinary man, combinations of trade and industry have grown to large proportions. The day of production on a small scale is becoming more and more circumscribed. The personal touch between employer and employee has practically disappeared and has been superseded by the impersonal relation between corporation and servant. The duties and responsibilities of the ordinary captain of industry afford him little, if any, time to devote to the human side of his business, even if by temperament and inclination he was prone to cultivate the friendship and good-will of his subordinates. It is gradually becoming more and more apparent that transportation must be concentrated in large capitalized groups. Large competing aggregations of transportation agencies make for efficiency and economy of operation. All workers, from the high executive to the day laborer, depend upon the successful operation of each individual property, the property serving the community and nation in proportion to the loyalty, efficiency, and enthusiasm of the individual worker. Co-operation is the keynote of success in such enterprises. Unfortunately, all do not agree in the definition of the word "co-operation."

All the animal kingdom and mankind work or perform in the hope of reward. To the animals we offer dainties; to the child at school, a good report card, or the approval of his teacher, is an incentive; the executive is compensated for his strain and anxieties by the success of his efforts and the remuneration that comes therefrom; the worker in all ranks is looking for the same reward as the executive, but in a lesser degree. To the worker, success means the commendation of his superior and associates, and the hope of material reward. Alas! deserved commendation is too often withheld; so much so that the worker often believes it is designedly withheld so as to stifle the hope of material reward. How can industry expect full efficiency if conscientious effort is not encouraged?

Co-operation, real co-operation, must be established between the impersonal corporation through its delegated executive and directors, and the rank and file if our railroads are

to continue under private control and operation. Many of us have a sure panacea for the troubles of our railroads. Many are sure real co-operation can not come without government ownership. Security owners and substantial business interests are strongly opposed to government ownership. All agree that efficient and dependable service is contingent upon comity between owners and officers of the corporations and the employees. The ordinary workers, that is, those outside the official personnel, must be taught to take a personal interest in the property from which they derive their living. The morale must be built up so that each employee will defend, and know why he defends, his railroad, when it is assailed either within or without the ranks.

There are many and divers theories for bringing about co-operation within the service and co-operation between officials and the other employees. The rank and file must feel that accomplishment will bring definite reward. Many officials contend that agreements hold them from such action, but this is surely a mistaken notion. Man must have an incentive to put forth intensive effort. Some years ago the steel trust evolved a scheme to interest its employees in the securities of the industry. Some railroad systems are following along similar lines. Care should be exercised that the securities are fully as represented or the cure may turn out to be a disease. Employees should be encouraged to own their homes. The floater is never more than a temporary asset to any stable industry. Governments the world over encourage their citizenry to own land, for landowners, great and small, are always patriots, ready to fight for their countries. The bidding system in the train service operates against this principle, but it would seem that some way might be found to reconcile runs with home stations. To the trainman, seniority in service, with its rights and privileges, is a great stabilizer, and an incentive for efficiency in service.

The employee should be educated so as to be able conscientiously to refute false propaganda. In all walks of life we hear false statements as to policy and resources of the railroads, and alleged malfeasance of the directing powers. Too many employees actually believe their own railroads are concealing assets in order to influence a low wage rate. The effort made to refute this false propaganda is not fully effective, being too direct and radical. The lay mind is not impressed with a mass of figures followed by statements to which his mind and reasoning are opposed. The effort should be simple and direct, gradually unfolding the principles to be developed. Monthly magazines in which employees share in shaping the policy, bulletins in stations, and schools of instruction, are all helpful agencies in molding the minds of the employees. In the last analysis, the employee is the medium to turn the mind of the people to right thinking regarding our railroads.

For several years the Interborough Rapid Transit Company of New York has posted helpful bulletins in its car windows, bulletins helpful to both company and patrons. For four years, the writer lived at Fort Washington Heights and was prone to complain of the service rendered. About five years ago, one of these bulletins informed the public that during the rush hours, a car passed over the 96th street cross-over switch every so many seconds. Any reasoning mind could realize that the subway service on that line at that time was at the peak. No doubt many were helped and pacified by the simple statements of facts so gracefully put forth.

If the railroads would issue monthly magazines, as before stated, setting forth truths in an interesting, readable style, readily comprehensible by the average lay mind, something would be accomplished in solving the problem of bringing back morale to the rank and file, as well as helping to mold public opinion through the employees. Dry statistics distributed to the ordinary person are a waste of paper and energy.

Let everyone "boost" co-operation.

WILLIAM W. TIRRELL,
Former Examiner, Interstate Commerce Commission.

When Headlight Meets Headlight

BUFFALO, N. Y.

TO THE EDITOR:

The very interesting article in your issue of October 14, page 703, throws light on a question that has been somewhat dark. This light, however, is so dazzling that the reader is not at first convinced that the darkness really has been dissipated.

In trying to compose the differing and sometimes opposing views of the different observers who are quoted by you, it has occurred to me that there are two simple points which did not happen to be mentioned by anybody. A headlight three miles away you can look at; but if it comes close up, you cannot; the glare is overpowering. This may not be a scientific way of looking at the question, but surely it indicates a very practical, if not a very precise, way of measuring the difference between seven miles and one-fourth of a mile.

Then, again, your various correspondents will, no doubt, agree with me that usually the vibration of the locomotive is sufficiently pronounced, when it is moving at ordinary speed, to enable an observer of its headlight to see and note the motion, sidewise or up and down; to tell quite readily whether or not the locomotive is stationary.

R. W. M.

DETROIT, Mich.

TO THE EDITOR:

In the symposium on electric headlights published in your issue of October 14, I notice that those of your informants who lay stress on the difficulty of estimating distances do not give their reasons in much detail. It is obvious that the condition of the headlight and the atmospheric conditions may vary greatly. If we analyze our difficulties, we shall find that in these features will be found, in many cases, the causes of our perplexity.

On the Grand Trunk, dimmers are made use of, intelligently; and in single-track territory an undimmed headlight is always to be taken as a danger signal. Seeing such a light ahead, an engineman must assume either that the engine whose light he sees is foul of the main line or that this is true of some part of the train attached to the engine. When a train goes into a side-track and the switch has been closed, the headlight is either dimmed or is entirely extinguished.

H. E. W.

Mr. Truesdale's Formula—and Hope

BOSTON.

TO THE EDITOR:

I wrote you the other day appealing for more serious attention to the problem of quickly settling disagreements about wages, working conditions and other things (*Railway Age*, September 30, page 598). Since then Mr. Truesdale, president of the Delaware, Lackawanna & Western has made a statement which powerfully reinforces the argument which I tried to present. It was in the annual report of the business of his company. He set forth the need of finding, for the task of solving the whole complex railroad problem, *broad-minded* men who can *inspire the confidence* of the public. The entire pregnant paragraph is worth quoting:

"It certainly would seem possible that in the not distant future some clear-headed, broad-minded, patriotic men who can inspire the confidence of a large majority of the best elements of our citizenship will study this problem and formulate a permanent policy that will fully meet the requirements of our people without the everlasting enactment of new laws, many of which are contrary to those already in effect."

I should like to emphasize a number of Mr. Truesdale's points. I cannot put the words in italics, for the numerous italicized clauses would tumble over each other. Look at the adjectives in the middle of the paragraph. How plentiful are

the public men who are patriotic but neither broad-minded nor clear-headed! Those qualifying words must have been put there because of their weight, not for mere rhetoric.

"Inspire confidence!" How utterly impossible, except as a man who has established his reputation by self-sacrificing public service. Conservative people will not have confidence in any man of unknown antecedents; yet half our lawmakers (who should be the originators of what we call public opinion) are essentially unknown; not perhaps because of their own fault, wholly; we citizens, in carelessly ignoring our aldermen and legislators, are neglecting a duty. These public servants ought to be praised for their good deeds and criticised for their errors; but we do this, if at all, in the most haphazard manner.

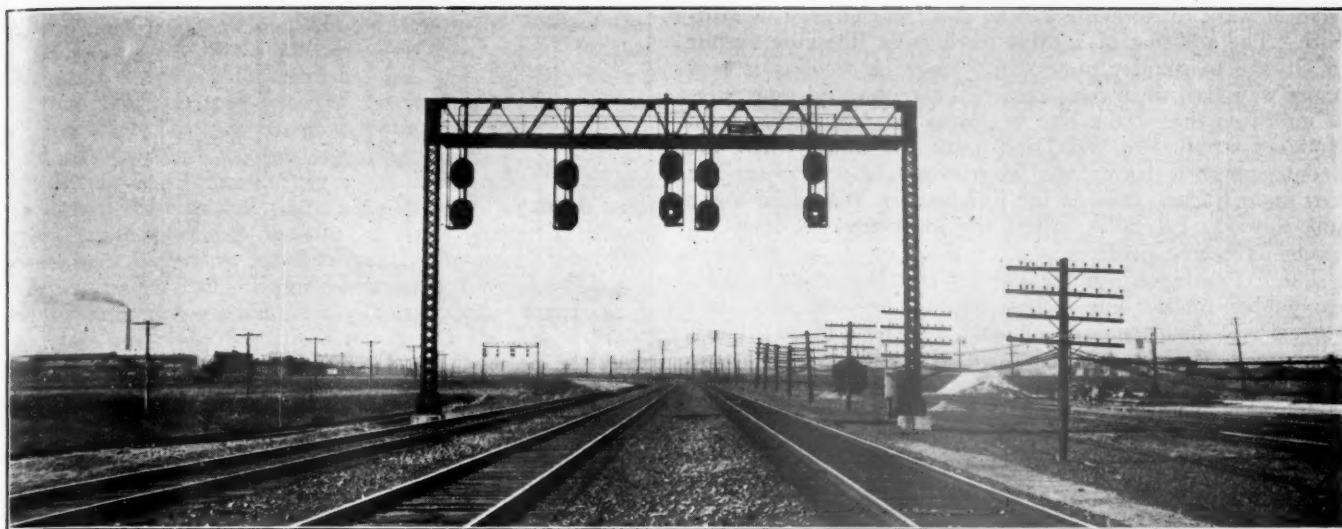
Confidence of "a large majority of the best citizens:" what a huge problem! Yet that is our task. It is necessary to convince a large majority of the wise and prudent to overcome the great number of short-sighted or selfish citizens who cannot be reached.

Mr. Truesdale wants competent and exemplary citizens who will study the railway problem and formulate a *permanent* policy. Here we come to the nub of the question. Congress has tried hard enough to fix up something permanent, but with what success, nobody at present can tell. Study is the thing; but where is our guide? One could imagine an autocratic president who would compel the 21 members of the House Committee on Interstate and Foreign Commerce to study history and philosophy and become real experts in at least the domestic side of their duties; but, alas! the study would have to begin back a year or two before these gentlemen were elected to Congress. If we desire to accomplish anything toward reform in the immediate future, we must do something besides pray for such a miracle as putting strong and courageous statesmen in these 21 seats of the Lower House of Congress.

In essence, Mr. Truesdale hopes that it is "possible that some clear-headed men will formulate a policy" to obviate the "everlasting enactment of new laws." How can this be brought about? What can a railroad president do besides keeping up a hope?

I am not a president and make no pretensions to being a prophet; and I do not offer a solution. I think I have done a good thing if I have got you to reprint Mr. Truesdale's deliverance and to call the attention of other presidents to the fact that here is a succinct statement of the chief issue of the day; a brief paragraph which ought to be committed to memory by every one of them, so that the duty of keeping the question uppermost shall not be forgotten. As a mere layman I will, however, offer one suggestion, namely, that it is the railroad presidents of the country who ought to take the initiative. Presidents Rea of the Pennsylvania, Markham of the Illinois Central, Loree of the Delaware & Hudson, and others, have made addresses occasionally and have, no doubt, influenced the public in some degree, but they have barely made a beginning; and they can only very slowly convince the man in the street that they speak at all times with truly unselfish public spirit. They must get some other kind of man to make addresses. Chief Justice Taft is no longer available. Of other impartial and wise citizens who might be named, it might be said that their reputations are too local. (It may be, however, that the only way to educate the citizenry of America will be by employing numerous local men; four-minute men, such as promoted Liberty bond buying). I nominate Sir William M. Acworth. Get him to speak and write to the people of this country for a year. It would take months to convince many of our poorly informed and narrow-minded neighbors of Sir William's knowledge, wisdom, integrity and fair-mindedness; but the trial would be well worth while. He knows American railroad life as well as Lord Bryce knew our political and social life.

E. MOSEMAN.



Looking Westward with Both Reversible Track Signals Showing Green (White in Illustration)

Modern Signals Expedite Heavy Suburban Traffic

Color-Light Signals and Traffic Levers Increase Capacity of Available Tracks on Lackawanna

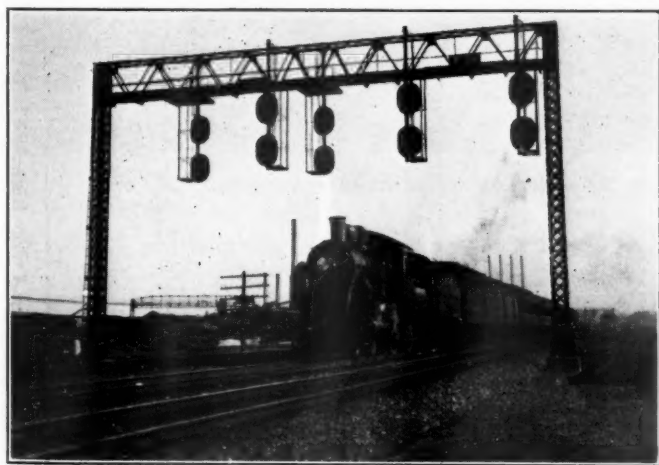
OPERATION of the Lackawanna's suburban trains in the New York district has been facilitated by the adoption on the section of line most difficult to operate of advanced operating methods, made possible by the installation of a highly developed signal plant using color-light indications throughout.

The section where the measures for improvement were taken lies between the Hackensack and Passaic rivers on the

The problem was to secure the greatest possible utilization of available running tracks as soon as the drawbridges were closed. Formerly trains so held up had to follow each other on one track, assuming again the space interval maintained by automatic block signals. Thus the opening of a drawbridge during the rush hour would cause delays to some trains much greater than the period of time when the draw was open.

The seriousness of the open drawbridge as a source of delay to trains can readily be understood when the company's figures of trains thus delayed are examined. In June, 1922, a typical month, a total of 4,491 suburban trains were run. Of these 179 met with delays and the delay to 104 (58 per cent) of these was chargeable to open drawbridges. On at least two occasions in the past the road has joined with others in the attempt to secure a ruling to the effect that drawbridges need not be opened during rush hours. On both occasions, however, river shipping interests with powerful political influence were able to defeat the railroads' proposals. The result is that during almost any rush suburban hour may be seen the ludicrous spectacle of a tugboat towing a sand barge through a drawbridge to the delay and inconvenience of thousands of passengers.

The increase in the Lackawanna's suburban passenger traffic has been very great in recent years. The road is now handling about 21,500,000 passengers a year at its Hoboken terminal and all but about 800,000 of these travel on suburban trains, by far the greater number of which move over the Morristown branch through Newark. Westbound through trains likewise move over this line, while eastbound through trains, a few suburban trains and practically all the road's freight trains move over the Boonton branch through Paterson. It is the line through Newark then, which has had to bear the brunt of the heavy increase in suburban traffic. Over this line are scheduled more than 160 passenger trains a day. Most of these trains are of all-steel equipment and during the rush periods they run from eight to twelve cars. Superheated steam eight-wheel, ten-wheel and Pacific type locomotives are used, frequently double-headed. Originally a double track line, it had been increased to three tracks



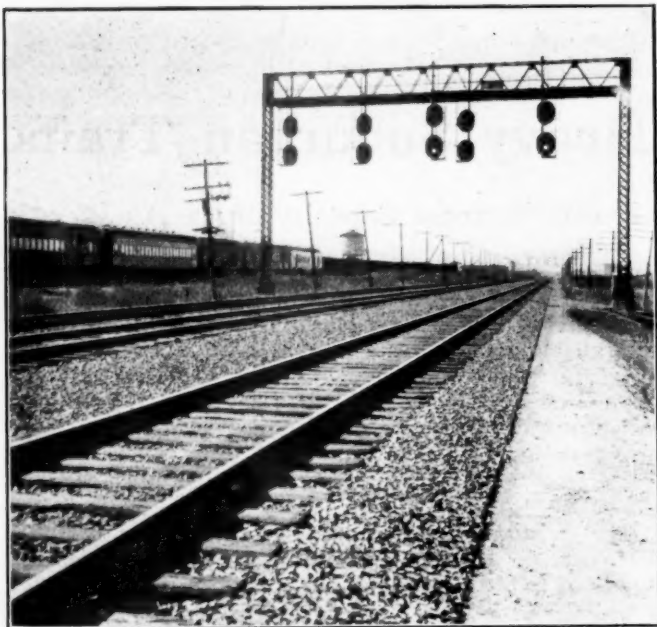
Looking Eastward with Hackensack Bridge in the Distance

The Three Eastbound and Two Westbound Signals Show the Two Reversible Tracks and the One Non-Reversible Eastbound Track. Train Is Westbound on No. 1 Track (Reversible)

road's Morristown branch, its heavy suburban line. Operating troubles, aside from those normally encountered in handling heavy traffic with a limited number of trucks, arise principally from the drawbridges over the Hackensack and Passaic rivers. Traffic in these rivers, particularly the former, is heavy and is increasing. With trains during the rush periods following each other at intervals of from one to five minutes, the opening of either drawbridge for a few minutes results in holding up perhaps as many as a dozen trains.

from Newark to Roseville avenue and from Orange to Millburn. The addition of a third track from Roseville avenue to Orange to connect these two three-track sections is now under way and, when completed will give the road nine miles of unbroken three-track line westward from Newark. From Hoboken terminal to West End tower, 1.9 miles, where the Boonton branch leaves the Morristown branch, there are four main tracks. It is on the line between West End tower and Newark, 5.9 miles, where the improvements described herein have been made.

The drawbridges over the Passaic and Hackensack rivers are double track. The section of line between these two bridges was also double track, and there was in addition a third track of light construction used for freight switching movements but not for passenger traffic. The first step taken to improve operating conditions was to rebuild this track applying heavier rail and rock ballast and making it available for passenger trains. The double track drawbridges were not altered, however, and no other track changes were



Looking Westward Near Sanford's Crossing

Strong Green Lights of Reversible Track Westbound Signals Show White in Illustration. In the Distance Two More Signal Bridges can be Seen, Showing the Close Spacing of Signals.

made, with the exception of providing crossovers where needed. The company then had (1) a four-track line from Hoboken terminal, 1.9 miles, to West End tower (which is just east of the Hackensack river); (2) a short double track line across the Hackensack river; (3) a three-track line from the Hackensack river to the Passaic river; (4) a short double-track line over the Passaic river to Newark and (5) a three-track line from Newark west. The problem was to secure the greatest possible efficiency from the two double-track sections over the rivers and the three-track section between them, in order to clear away as rapidly as possible any congestion of traffic occasioned by the opening of a drawbridge and any normal congestion which might result by reason of the two short double-track sections in a territory where three or four tracks have been found necessary to meet the demands of traffic.

Ordinarily where three running tracks are provided two of them may be used in one direction only and the third is reversible during certain hours of the day. The Lackawanna has improved upon this practice by making only one of its three tracks, i.e., track No. 2, between the rivers usable in one direction only, viz., eastward. The other two tracks, No. 1 and No. 3, are reversible, and not during certain hours

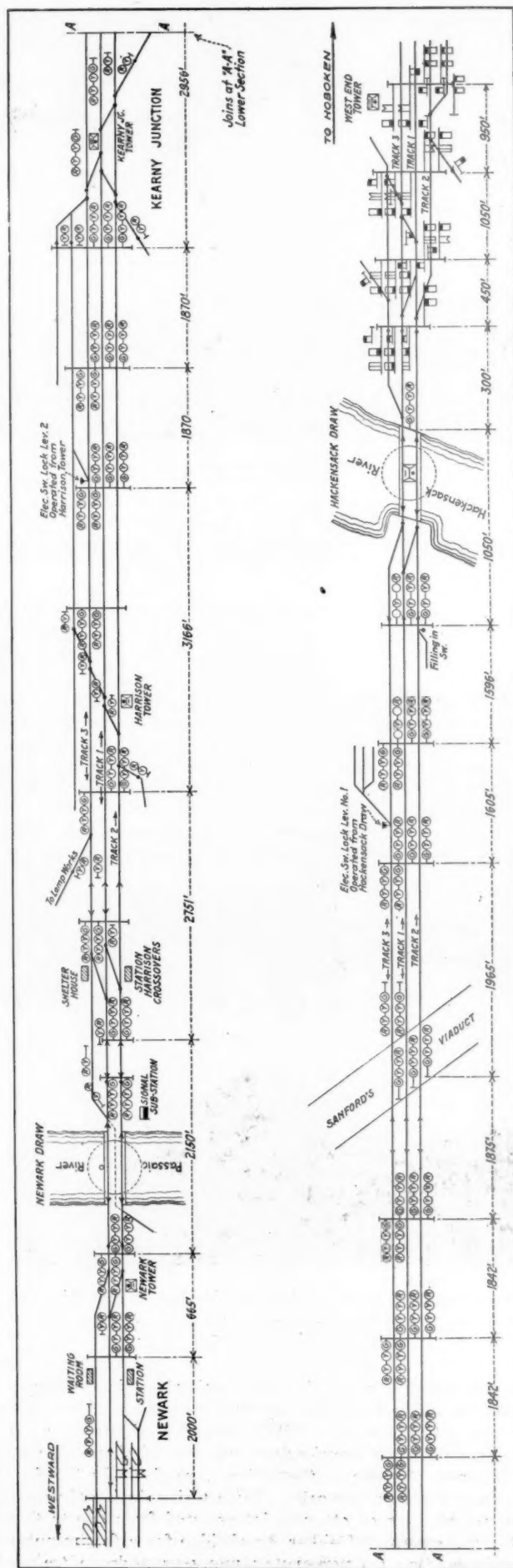


Diagram Showing Color Light Signals Between West End and Newark—Upper Section Joins Lower at Left

of the day only but at all times. Furthermore, both of the two tracks over the rivers are reversible at all times. By the addition of this track the road has doubled the capacity of this section of its line, allowing for ten trains in a given direction where there was room for but five before.

Without the most modern signaling equipment, however, it would not be practicable to reverse the direction of traffic over a given track at any time during the day. Traffic levers, therefore, are provided in all the signal towers between Newark and West End tower to control the operation of the reversible tracks. The traffic lever must be set in proper position before a signalman can display a clear signal to a train on a reversible track and the signalman cannot place his lever in proper position unless the signalman in the next tower places his lever governing that section of track in the same position. This the second signalman cannot do until he has displayed the stop signal against opposing movement.

For example, take the rush period in the morning when the heaviest movement is eastbound. Assume that two eastbound trains arrive at Newark simultaneously, one on track No. 1 and the other on track No. 2. Naturally, during this period one of the two bridge tracks, i.e., No. 2, will have its traffic levers set normally for eastbound movement, so one

bound. At the drawbridges one track will normally be lined up for eastbound and the other for westbound movement. Under normal conditions very little changing of traffic levers is necessary, except that governing one of each of the bridge tracks and to allow for freight switching movements over track No. 3. During the evening (westbound) rush both reversible tracks between the rivers are lined up for westbound movement and eastbound traffic moves exclusively over No. 2, the non-reversible track. At the bridges, one track (No. 1) is lined up for west bound and one (No. 2) for eastbound movement and frequent shifting of levers will occur only for one of these tracks on each bridge when they are used, temporarily, for westbound trains.

In spite of the fact, however, that only at the bridges are changes in the direction of traffic sufficiently numerous to bring the levers into frequent use, the provision of them elsewhere makes for a flexibility of operation which in turn reduces to a minimum delays to following trains by derailment or by signal failures. If a reversible track is blocked for any cause, a signalman has only to shift the traffic lever for the remaining reversible track and following trains, crossing over, may proceed without delay.

The automatic signals in this territory are noteworthy.



Looking Eastward at Sanford's Crossing—All Signals Clear—Next Signal Bridge Visible in Distance

of the trains will naturally find the signals in position for its movement. The signalman, however, is aware of the approach of the second train and, let us assume, knows that no westbound trains are due. He will try to move his traffic lever governing track No. 1 to allow the second train to proceed over it. If the signalman at Harrison tower co-operates, sets his signal against opposing westward movement and moves his lever as desired, then the signalman at Newark can allow the second train, as well as the first, to proceed on its journey without delay, using track No. 1 over the bridge. Without the traffic lever, he would have to hold the second train until the first had departed and cleared the block on track No. 2.

Traffic levers are provided similarly to govern the two reversible tracks, Nos. 1 and 3, between Harrison tower and Kearney Junction, Kearney Junction and the Hackensack bridge tower and Hackensack bridge tower and West End tower. In practice there is not much frequency in reversing the direction of traffic except over the two drawbridges. Over the three track section one track, No. 2, is non-reversible eastbound. During the morning rush the traffic levers will be lined up to convert one of the reversible tracks, i.e., No. 1, also to eastbound movement and the other (No. 3) to west-

They, as well as the interlocking signals, are exclusively of the color-light type, using high voltage alternating current supplied by the company from its Hoboken power house, with a connection to the power lines of the Public Service Electric Company as an auxiliary source of supply. Fog and smoke often seriously obstruct vision in the Hackensack meadows and the color lights have a higher degree of visibility by either day or night than any other type of signal under these conditions. All interlocking plants in the territory are of the electro-pneumatic type of the latest design. Automatic block signals have four indications, as follows:

| Color given by | Indication |
|---------------------------------------|--|
| 1. Red Light over Yellow Light..... | Stop and proceed |
| 2. One Yellow Light..... | Approach Next Signal Prepared to Stop |
| 3. Yellow Light over Green Light..... | Approach Next Signal at Restricted Speed |
| 4. One Green Light..... | Proceed |

The signals on these tracks are close together, a number of them being only about 1,800 ft. apart. This, of course, makes for high track capacity. Furthermore, with four indications, high speeds when the clear indication is given are safer than where only three indications are provided. The engineman will pass two warning signals, allowing ample time for reducing speed, before he comes to a stop signal.

The Lackawanna has, therefore, not only doubled the capacity of its line across the meadows by the addition of another running track—it has also made safe high rates of speed by the use of four-indication signals.

High interlocking signals have six indications, as follows:

| Color given by | Indication |
|---------------------------------------|--|
| 1. One Red Light..... | Stop |
| 2. Red Light Over Yellow Light..... | Proceed at Slow Speed Prepared to Stop |
| 3. One Yellow Light..... | Approach Next Signal Prepared to Stop |
| 4. Yellow Light over Green Light..... | Approach Next Signal at Restricted Speed |
| 5. Red Light over Green Light..... | Proceed at Restricted Speed |
| 6. One Green Light..... | Proceed |

Slow speed interlocking signals have two indications: One red light, indicating stop, and one yellow light, indicating proceed at slow speed prepared to stop.

Telephones have been provided at all signal bridges and main line switches have been provided with electric switch locks controlled by towermen.

Officers of the company hold the new signal system and the results they are obtaining from it in high regard. They report, too, that enginemen, although at first rather doubtful about the color-light signal, now are enthusiastic about it. The company is extending this form of signaling westward to Orange in connection with its extensive track elevation work at East Orange. When this work is completed, the company will have 9.4 miles of its line of heaviest traffic equipped exclusively with this type of signal.

Freight Car Loading

WASHINGTON, D. C.

REVENUE FREIGHT loading in the week ended October 14 increased 15,301 cars as compared with the week before, but was still slightly below that for the week of September 30, which was the largest so far this year. The total was 983,470, as compared with 910,529 in the corresponding week of last year and 1,018,539 in the corresponding week of 1920. The loading for that week of 1920 was the heaviest for any one week in the history of American railroads. The loading for the corresponding week this year is 3.4 per cent below that figure.

In the Southern, Central Western and Southwestern districts the loading was in excess of that for the corresponding week of 1920 and in all districts except the Pocahontas it was in excess of that for last year. Increases as compared with the preceding week were shown in grain and grain prod-

ucts, coal, coke, forest products and miscellaneous, but there were decreases in live stock, ore, and merchandise l.c.l. As compared with the corresponding week of last year there were increases in all classes of commodities except merchandise, l.c.l. This is regarded as an excellent indication of the improvement in business conditions as in dull times much freight is shipped in less than carload lots which at other times would be shipped in full carloads. The summary as compiled by the Car Service Division of the American Railway Association is given below.

The car shortage showed a further increase during the first week of October to 141,252, of which 40,499 were coal cars and 71,063 were box cars. At the same time there were surpluses averaging 5,500, including 3,024 coal cars and 97 box cars. During the period October 8-15 there was a further increase in the shortage to 156,309, while the surplus was reduced to 4,275. The shortages included 77,111 box cars, 44,984 coal cars and 7,631 refrigerator cars.

An improvement in the motive power situation is shown by reports filed today by the carriers with the Car Service Division. On October 1, 19,727 locomotives, or 30.6 per cent of the total on line were in need of repairs. On September 15, last, 20,157, or 31.4 per cent were in need of repairs. This was a net decrease during the last half of September of 430 locomotives.

At the same time, the railroads on October 1 had 44,703 serviceable locomotives which was an increase of 538 over the number serviceable on September 15. This increase was due to the larger number being repaired and turned out of the shops, and also to the installation of new locomotives.

Of the total number in need of repairs on October 1 last, 16,313 were in need of repairs requiring more than 24 hours. This was a decrease of 259 under September 15. There were also 3,414 locomotives in need of light repairs which was a decrease of 171 since September 15. From September 1 to September 15, 9,047 locomotives were repaired and turned out of railroad shops, while from September 15 to October 1, the total was 11,213, or an increase of 2,166 over the first half of the month.

The number of serviceable locomotives stored in October 1 was 1,501.

THE PORT HURON & DETROIT is being operated as a separate property, the contract under which it was operated by the Detroit, Bay City & Western having been terminated by mutual consent.

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, OCTOBER 14, 1922

| | | Total revenue freight loaded | | | | | | | Corresponding year, 1921 | | Corresponding year, 1920 | |
|-----------------------|------|------------------------------|------------|---------|--------|-----------------|--------|--------------|--------------------------|-----------------|--------------------------|--------------------------|
| Districts | Year | Grain and grain products | Live stock | Coal | Coke | Forest products | Ore | Mdse. L.C.L. | Miscellaneous | This year, 1922 | Corresponding year, 1921 | Corresponding year, 1920 |
| Eastern | 1922 | 8,913 | 3,281 | 59,410 | 1,847 | 5,776 | 4,876 | 62,654 | 92,441 | 239,198 | 216,317 | 246,966 |
| | 1921 | 8,799 | 3,383 | 51,741 | 1,889 | 4,392 | 1,162 | 62,150 | 82,801 | ..... | ..... | ..... |
| Alleghany | 1922 | 3,179 | 3,207 | 59,503 | 5,179 | 3,183 | 9,350 | 43,871 | 74,156 | 201,628 | 175,690 | 214,605 |
| | 1921 | 2,477 | 3,280 | 53,434 | 2,666 | 2,949 | 2,949 | 48,647 | 59,288 | ..... | ..... | ..... |
| Pocahontas | 1922 | 224 | 369 | 18,156 | 275 | 1,498 | 25 | 5,373 | 3,579 | 29,502 | 36,826 | 37,694 |
| | 1921 | 212 | 474 | 25,137 | 172 | 1,221 | 111 | 5,569 | 4,030 | ..... | ..... | ..... |
| Southern | 1922 | 3,632 | 2,539 | 22,769 | 1,074 | 20,080 | 1,261 | 39,064 | 46,304 | 136,723 | 132,745 | 135,338 |
| | 1921 | 3,434 | 2,361 | 26,990 | 466 | 16,838 | 508 | 40,324 | 41,834 | ..... | ..... | ..... |
| Northwestern | 1922 | 18,792 | 9,769 | 10,005 | 1,300 | 15,096 | 28,314 | 28,314 | 42,406 | 153,996 | 134,752 | 167,939 |
| | 1921 | 15,682 | 9,030 | 11,110 | 741 | 12,766 | 13,655 | 29,189 | 42,579 | ..... | ..... | ..... |
| Central Western..... | 1922 | 18,554 | 15,843 | 19,825 | 386 | 7,311 | 2,108 | 31,474 | 61,319 | 150,820 | 146,145 | 145,513 |
| | 1921 | 13,004 | 14,065 | 21,997 | 218 | 7,191 | 736 | 32,063 | 56,871 | ..... | ..... | ..... |
| Southwestern | 1922 | 5,198 | 4,133 | 7,258 | 147 | 6,783 | 425 | 15,373 | 32,286 | 71,603 | 68,054 | 70,484 |
| | 1921 | 4,239 | 3,416 | 5,138 | 147 | 7,405 | 799 | 16,458 | 30,452 | ..... | ..... | ..... |
| Total Western Dists.. | 1922 | 36,544 | 29,745 | 37,088 | 1,833 | 29,190 | 30,847 | 75,161 | 136,011 | 376,419 | 348,951 | 383,936 |
| | 1921 | 32,923 | 26,511 | 38,245 | 1,106 | 27,362 | 15,190 | 77,710 | 129,902 | ..... | ..... | ..... |
| Total all roads..... | 1922 | 52,492 | 39,141 | 196,925 | 10,208 | 59,727 | 46,362 | 226,123 | 352,491 | 983,470 | 910,529 | 1,018,539 |
| | 1921 | 47,347 | 36,009 | 195,547 | 6,299 | 52,762 | 19,820 | 234,390 | 317,855 | ..... | ..... | ..... |
| | 1920 | 40,810 | 35,056 | 226,671 | 15,778 | 60,312 | 76,429 | 209,692 | 353,791 | ..... | ..... | ..... |
| Increase compared.... | 1921 | 4,645 | 3,132 | 1,379 | 3,909 | 6,965 | 26,542 | ..... | 34,636 | 72,941 | ..... | ..... |
| Decrease compared.... | 1921 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Increase compared.... | 1920 | 11,682 | 4,085 | ..... | ..... | ..... | ..... | 16,431 | ..... | ..... | ..... | ..... |
| Decrease compared.... | 1920 | ..... | ..... | 29,745 | 5,570 | ..... | ..... | 1,300 | ..... | 35,069 | ..... | ..... |
| October 14..... | 1922 | 52,492 | 39,141 | 196,925 | 10,208 | 59,727 | 46,362 | 226,123 | 352,491 | 983,470 | 910,529 | 1,018,539 |
| October 7..... | 1922 | 50,553 | 39,359 | 189,312 | 9,880 | 57,844 | 47,439 | 228,515 | 345,267 | 968,169 | 899,681 | 1,011,666 |
| September 30..... | 1922 | 52,129 | 39,830 | 189,349 | 9,456 | 58,742 | 49,777 | 234,517 | 354,581 | 988,381 | 904,831 | 992,283 |
| September 23..... | 1922 | 52,379 | 36,896 | 187,896 | 8,671 | 58,853 | 49,587 | 234,371 | 344,638 | 973,291 | 873,641 | 1,008,109 |
| September 16..... | 1922 | 52,090 | 34,929 | 172,241 | 8,188 | 57,371 | 53,293 | 234,513 | 333,294 | 945,919 | 852,552 | 991,166 |

Cabinet Officers Discuss Transportation

Various Problems Considered in Campaign Speeches in Different Parts of the Country

VARIOUS aspects of the transportation problem are being discussed by members of the President's cabinet in campaign speeches in different parts of the country. While Secretary Davis of the Department of Labor in a speech recently advocated the abolition of the Railroad Labor Board, Secretary Wallace of the Department of Agriculture, in one of his speeches, insisted that quarrels between railroads and their workmen which hang up freight movement must be stopped in some way or other. He also referred to the "burdensome" effect on agriculture of the present freight rates. Secretary Hoover in a speech at Detroit on October 18 laid much of the responsibility for the present inability of the railroads to meet all the transportation demands of the shippers on too much regulation. Attorney General Daugherty also made a speech at Canton, Ohio, on October 21, in which he denounced the radicalism of certain labor leaders and told of the actuating methods which compelled him in the name of the government to institute injunction proceedings at Chicago recently in the railroad strike.

Hoover on Car Shortage

Discussing the rail situation as it now relates to grain and coal shipments, Mr. Hoover said:

"The American roads have been so over-regulated during the last score of years that they find it difficult to finance the cost of acquiring the rolling stock and equipment necessary to keep pace with the ever-increasing industrial and agricultural needs of the country.

"Every year there has developed a serious car shortage and as a result there is today in New York a 5 per cent premium per bushel on wheat for export, due to the inability of the railroads to move grain in sufficient quantity to fill foreign demand. This premium does not add to the wealth of the farmer but is a direct charge against his just profit.

"There also exists a premium on soft coal ranging from 35 to 60 per cent above the normal price because of the car shortage. If there were sufficient cars to transport the coal the mines are capable of producing there would be no such premiums.

"It is safe to estimate that the car shortage levies a direct charge each year on both the producer and consumer of necessities of life, which amounts to no less than the entire annual cost of administering the affairs of the Federal government."

Wallace on the Farmer and Strikes

In an address before the Knife and Fork Club of Kansas City, Missouri, on October 23, Secretary of Agriculture Wallace said:

"There are two things about our transportation system which the farmers want fixed. First, freight rates on agricultural products should be decreased. They are too high with relation to the prices the farmers get. Transportation is a part of production, so far as agriculture is concerned. The farmer pays the freight. He does not want the railroads to reduce freight rates so low that they can not furnish efficient service. Service is important to the farmer. But freight rates are now too high. The farmers want the railroad people to cut down their operating costs, to insist upon a fair day's work for a fair wage, to move their freight cheaper, and thus be able to cut down rates.

"Second, some way must be found to break monopolies of both capital and labor and keep them at work. These quarrels between the railroads and the workmen, which hang

up freight movement, must be stopped in some way or other. Farmers are both capitalists and laborers. There is more money invested in agriculture than in any other industry. There are more working people on the farms than in any other sort of work. But farmers get lower returns on their invested capital than the railroads get. They work longer hours and for much less pay than railroad workmen. Being both capitalists and laborers, the farmers can understand and sympathize with the just and lawful aspirations of both capital and labor. More than this, the farmers want both to prosper so they can buy their crops at fair prices. Farmers recognize the right of capital to organize, because only in that way can large business enterprises be carried on. Farmers also recognize the right of labor to organize and be able to bargain effectively with organized capital. But farmers do not recognize the right of labor organizations to conspire and tie up railroad traffic. Farmers have no sympathy with the sort of lawlessness which we had during the railroad strike. There are no words strong enough to condemn murder of men, intimidation of women and children and wanton destruction of property. The right to work is just as sacred as the right to quit work, and must be upheld by all the force of organized society.

"Interference with transportation is a direct attack upon the farmer and his family. Many growers of perishable stuff have gone bankrupt because they could not move their crops. Grain growers and live-stock producers have lost millions upon millions of dollars during the past six months because railroad owners and railroad workmen could not agree. The farmer is sick and tired of this sort of business. He can not stand it any longer.

"There can be no dispute between railroad owners and railroad workmen which can not be settled in an orderly way, with full justice to both, without interference with traffic and without imperiling the business and lives of innocent people. The rejection of lawful means of settlement and the appeal to lawlessness, whether by capital or by labor, must stop. If it does not stop, then in self-defense the farmer will be driven to adopt similar methods. If that should happen people in the cities would starve and we should have anarchy instead of government. The farmer can take care of himself, and he will if he must. He can live on his own farm. But if class is to be arrayed against class, if every group is to organize and fight every other group, our great republic will break down and with it will go the most advanced civilization the world has ever seen. We can not permit that to happen."

Daugherty on the Shopmen's Strike

"The Department of Justice," Attorney General Daugherty said, "had spent a million and a half dollars as economically as possible in a period of seven weeks during the rail strike to preserve 'public interests.' The government and the laws and the courts were being mocked, millions of dollars worth of personal property was being destroyed, and human life, itself, he said, was being sacrificed, as a result of strike conditions.

"The railroads of the country," the Attorney General declared, "are compelled by law to furnish interstate commerce for the country. It is the duty of government to see that this obligation is performed according to the letter of the law. The roads were attempting to keep interstate commerce alive, but conditions had reached a point where this was made impossible through lack of skilled workers, de-

terioration of equipment, and other conditions brought about by the strike of 400,000 members of the federated shop crafts unions.

"When the government acted, it was a duty, not to labor, not to the railroads, but to the American people and to the government itself. More than 17,000 affidavits from every section of the United States concerning anarchy bordering on civil war furnished convincing proof that the people needed the protection of their government as never before.

"Bear in mind that I did not undertake this proceeding as a partisan or as the advocate of the railroads. As between the railroads and those with whom they were in conflict, considering the matters in dispute, I was neutral, and I took no action on behalf of the government until it became apparent to the entire country that interstate commerce and the carrying of the mails were being interfered with to the extent that our people and our industries were being materially affected. The transportation crisis through which we passed came dangerously *near imposing a veto upon the economic readjustment of our national life.*"

Mr. Daugherty said that when the railroad workers walked out they were in revolt against organized government. "In practically every other industry in this country and throughout the world," he said, "war-wage scales had been abandoned, but union leaders demanded continuation of wage inflation at the war peak. The government and those chosen to safeguard its integrity and constitutional rights, believe that labor deserves and should enjoy an equitable wage scale. There is no quarrel between labor and government upon this issue.

"Industrial paralysis, human suffering and irretrievable losses confronted the nation as train after train was laid off. Cessation of traffic was destroying the arteries of trade and commerce. Sporadically tales came out of the west, the southwest and the south and from our northern border states of derailments, maiming, sabotage, and even murder.

"Appeals were being made to Washington by countless thousands of American citizens. Scarcely a community in any part of the broad, free land was being spared the iron heel of terrorism. Depredation of property was in full swing, and human life was anything but sacred. All the great trans-continental systems were jeopardized, and the Interstate Commerce Commission, after infinitely painstaking surveys, had found that the rolling stock and equipment of the afflicted roads were so seriously impaired that 50 per cent of the locomotives in use were unfit for service and many were out of commission entirely.

"Then, when all conciliatory efforts on the part of trusted government emissaries had failed, when court proceedings in practically every district in the United States had been instituted by the railroads to safeguard their property and prevent willful and malicious interference with the orderly operation of their lines, when men were willing and anxious to work if permitted to do so, when transportation was impaired 50 per cent or more, the time had arrived when national security no longer made it possible for government to stay its hand.

"Appeal after appeal had come to Washington for troops," Mr. Daugherty said, "but they were withheld. Who of you will say that it is not better to lay the hand of government, with its persuasion, its restraint, its admonition and protection, on the shoulder of the citizen, than to call out troops to shoot him down, and, as is always the case, mingle his blood with the blood of innocent bystanders and bruise the hearts of his loved ones?

"It must be remembered," he added, "that the freedom of speech guaranteed under the constitution is *not* that freedom of speech which incites mob violence, destruction of life and property and attacks on government. That is not what our forefathers intended by vouchsafing freedom of speech and liberty of press.

"May I call the attention of the law respecting citizens of this country to the fact that no frenzied voice was lifted by these same pedagogic pawns of profligacy when law-abiding American citizens by the hundreds, all over the land, were dragged into the mire of the woods, stripped of their clothing and there left; when almost as many, according to pre-arranged schedule, well carried out, it seems, by somebody, were tarred and feathered, when others were thrown into streams and their clothing carried off by the vandals.

"Where were those frenzied voices now crying out for freedom of speech, when the loyal engineer and his crew, in the dead of night, faithful to their service and their country, pulled twelve Pullman cars across the continent only to be suddenly switched into eternity without a moment's notice by the vandal and murderer who pulled the spikes and threw the switches that murder might contribute to the cause of anarchy, and anarchy might destroy government.

"The fact of the matter is," Mr. Daugherty said, "that under the circumstances and evidence existing and proved in the case at Chicago, had the attorney general not complied with the provisions of the law by taking the action he did, he could have been impeached, and any attorney general failing or refusing under similar circumstances to do precisely what was done, should be impeached.

"There will be no backward step in the policy of the government as at present organized," the attorney general said, adding that "I think we have reached the day when it may truthfully be said that we have seen in the United States the last extensive strike involving and tying up of transportation."

In a pronouncement to labor the attorney general said: "Your principal trouble lies and your greatest danger is in the radicalism and character of some of your most prominent leaders. Your security lies in the constitution of the United States and in the laws of the United States, and in the good opinion, by you deserved, of all the American people.

"A few irreconcilable railroad executives, who insist upon calling themselves 'hard-boiled,' might also, with considerable benefit to the country, be dispensed with. The fault is not all on one side, but at a time when strife that was almost civil war raged in this country, the government, having the right to do so, insisted upon the railroads performing their necessary functions to serve the people. Those in conflict with the railroads interfered with the performance of this service, and it was to protect the right of all the people that the injunction proceeding was brought."



International

Railway Construction in Kenya Colony, East Africa

Development of Concrete in Railway Construction*

A Study of the Design of the Minor Structures on the Delaware, Lackawanna & Western

By M. Hirschthal

Concrete Engineer, Delaware, Lackawanna & Western

THE MINOR STRUCTURES may be divided roughly into two groups, one for crossings in the sparsely populated country districts, the other for those in the suburban municipalities with well-defined widths of streets. In the country districts where property along the roads is undeveloped, the problems are more simple, since restrictions as to grade and headroom are generally not severe; therefore the semi-circular arch is more generally used for undercrossings. For overhead bridges an arch is more advantageous in both groups, because it permits of commencing the grades on both approaches with only an intervening vertical curve whose point of intersection is at the center of span, the only disadvantage of this type being the restriction of vertical clearances over the side tracks.

Arch Undercrossings

The semi-circular arches for undercrossings vary in span from 20 to 33 feet, depending on the requirements, usually

form with ornamental details (Fig. 11), and which show the effectiveness of the treatment in each case.

At Kingsland, N. J., where Ridge Road crosses the track, an arch bridge of this elliptical type had been erected some years prior to the decision to locate a new station at the same site, that is, alongside the existing structure. The parapet and railing were torn down on the side adjacent to the proposed station and the arch foundations for the building were then constructed and connections made with the old arch bridge, as shown by the details, Fig. 12.

At Glen Ridge, N. J., the station, grounds and adjacent topography are delightfully rustic in character. Ridgewood Avenue is the thoroughfare that leads to the station and crosses the creek parallel to the tracks by means of a brown-stone arch bridge in keeping with the surrounding coloring. It was necessary to renew the bridge over the tracks and the type of structure selected was an elliptical concrete arch with stone face for both arch ring and parapets, the



Fig. 6—Typical 30-ft. Semi-Circular Arch

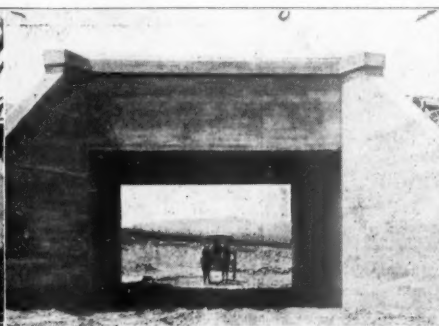


Fig. 7—Flat Top for Limited Clearances



Fig. 8—Segmental Arch for Wide Roadway

governed by the density of traffic along the highway in question. A typical 30-foot semi-circular arch is shown in Fig. 6. Exceptions occurred where clearances necessitated the using of flat construction for single spans, in which case either "T" beams or simple slabs were utilized as in Fig. 7.

In rare instances, where it was necessary to provide an exceptionally wide roadway, segmental arches were designed. This occurred near Hopatcong, where a 40-foot segmental arch bridge was constructed and treated architecturally to produce a pleasing structure as may be noted in Fig. 8. Several segmental arches of larger span were also constructed for the Orange improvements.

Overhead Arches

For overhead bridges the elliptical form of intrados for the arches was generally used because of the additional vertical clearance resulting from the use of that curve as compared with the segmental and because of its pleasing appearance. In addition to the unadorned arch bridge of this type (Fig. 9), there are shown two, one of which is this type architecturally treated (Fig. 10), while the other is segmental in

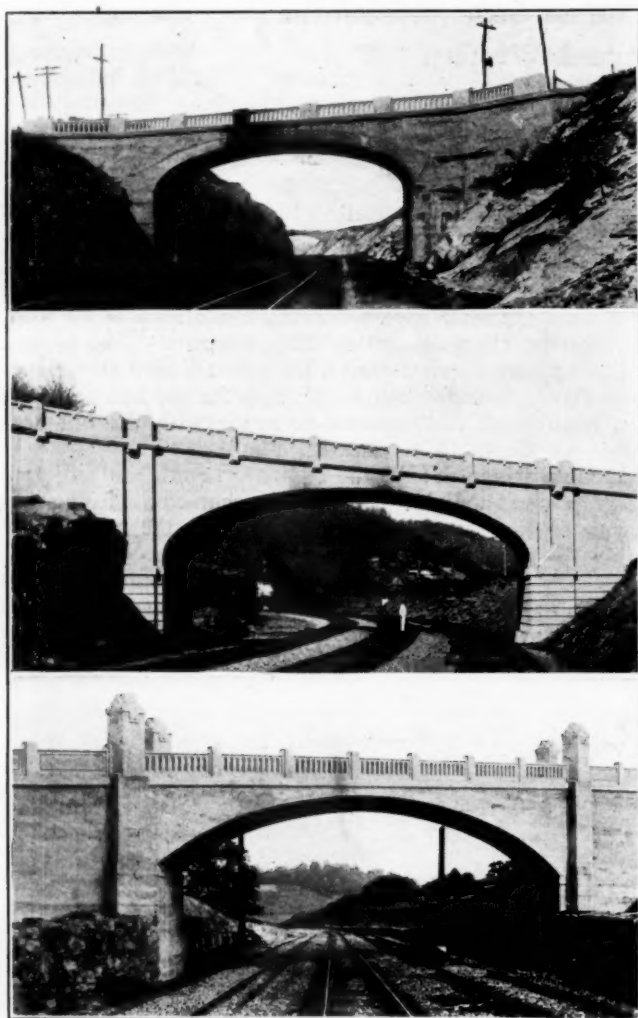
construction being joined to the existing stonework of the arch bridge over the creek in absolute harmony, Fig. 13. Sneed's Crossing at Convent, N. J., is shown to illustrate the architectural treatment of a basically unsymmetrical two-span structure of this type, Fig. 14.

Where conditions were such as to provide ample headroom, together without crops of rock in locations available for foundations, long span segmental arches were designed which result in striking structures, as shown in Fig. 15. Another structure of this type that is not ordinarily met with is the overhead arch at New Milford, Summit, Pa., Fig. 16. The intrados of this arch conforms to the parabolic curve, the radii and centers of circles being selected so as to approximate very closely the parabola selected to meet the conditions of rise and span existing for this case. These radii and centers are given to facilitate the laying out of the forms for the arch ribs. The abutments for the arch ribs are continuous. The approach and spandrel spans are of the T-beam and slab type. The end piers of the structures are open to permit of the fill sloping through, and short walls are cantilevered from the piers so that the slope will not encroach on the roadbed of the tracks.

Another striking structure which, however, combines sev-

* This is the second of three articles; the first appeared in the *Railway Age* of October 14, page 705. The third will appear in an early issue.

eral types of construction into a pleasing combination, is the Roaring Brook viaduct at Park street, Dunmore, Pa., which has a structural steel span over the tracks, a long span arch



Three Overhead Highway Crossings

Fig. 9—Lanternman Cut Arch

Fig. 10—Alford Roadway Arch

Fig. 11—Fuller Roadway Arch

over the brook and T-beam girder and column construction for the remainder of the viaduct, Fig. 17.

While the arch is the prevailing type for overhead bridges,

the T-beam type has also been largely used. Fig. 18 is the only example of the three-span type of overhead highway bridge on the Lackawanna where the center span is made large enough to provide for the two main tracks and the necessary side clearances while the spans on either side are made long enough to provide for one side track and to take the slope of the fill to the roadbed.

Milwaukee Road at Clarks Summit, Pa. (the beginning of the Pennsylvania cutoff), crosses both the old tracks and the new at an elevation far beyond the requirements for clearance. Long span T-beam construction was selected as most suitable for this case and the beams were somewhat



Fig. 13—A Stone Faced Concrete Arch at Glen Ridge, N. J.

arched for architectural effect. There are six spans of 50 ft. each, center to center of columns, and two of 45 ft. with two expansion joints for a total length of 395 ft. (See Fig. 19 for illustration.)

A viaduct at Willow Grove, Pa., combines several types of floor construction in one viaduct. The road crosses the tracks at an angle of 45 deg. and as the span for two tracks and side clearances is 30 ft., the T-beam type was selected for this portion of the viaduct, the T-beams being at right angles with the center line of tracks; the skew ends are supported by the reinforced concrete fascia girders. The highway provides for a street car track, separated from the roadway by a curb, so that at the approaches the two-way reinforced slab was selected for the roadway, supported on girders along the face and at the curb line, while a simple slab spanning from the curb girder to the other face was selected to carry the street car loading. There is a curve at

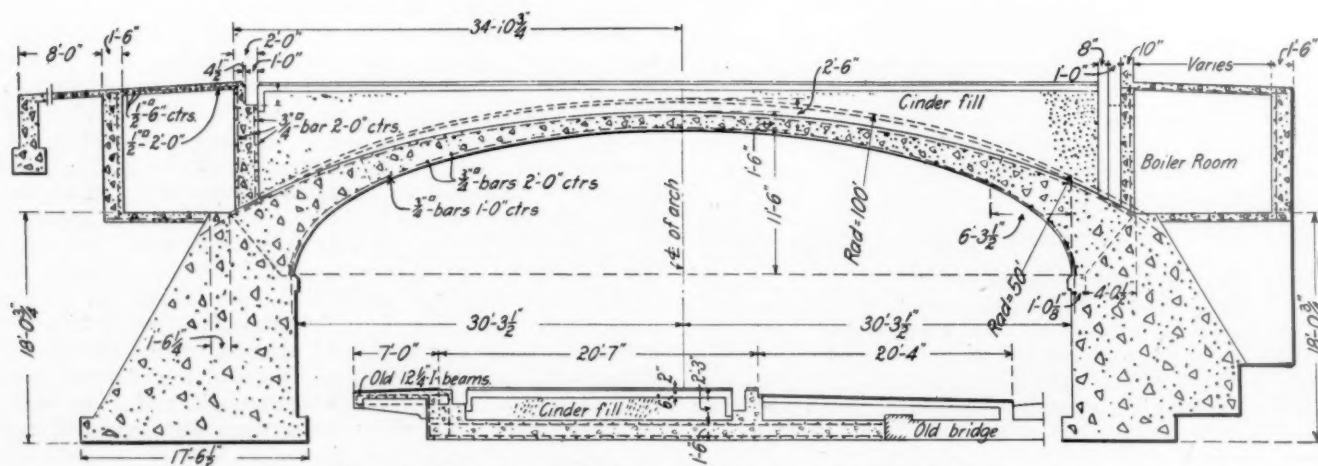


Fig. 12—Sixty-foot Arch Over the Tracks at Kingsland, N. J.

each approach in the opposite direction, the road being on a reverse curve at this point.

Unusual difficulties were presented in the design of the Bloomfield Avenue bridge at Montclair, N. J. Bloomfield Avenue was a busy thoroughfare prior to the improvement,

sections if designed as "gravity" sections. The ordinary reinforced sections having been estimated as very expensive, the cellular type of wall was designed, the writer believing this to be the first example (1911), with a thin slab surmounting the walls to carry the sidewalk loads, Fig. 20.

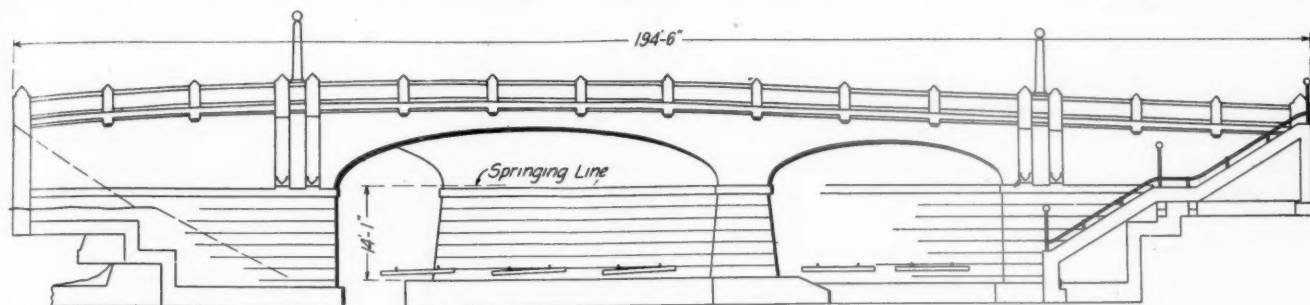


Fig. 14—An Unsymmetrical Two-Span Arch Bridge Over the Tracks at Sneed's Crossing

having a double-track suburban car line crossing the railroad at grade at an angle of about 32 deg., resulting in a skew of 58 deg. Under the track was a large culvert, crossing the line of the railroad at an angle of 80 deg. and its bottom at a depth of about 25 ft. below top of rail so that



Fig. 15—High Arch Span Over a Deep Rock Cut
Fig. 16—Parabolic Rib Arch at Milford Summit, Pa.

the roadway slab for the new crossing was almost 50 ft. above the brook. Part of the abutment therefore had to be carried on the culvert and its extension, and with rock foundation at one section and soil at another the problem became quite complicated. In addition the approach walls were almost 50 ft. high, which would have resulted in enormous

A very striking structure is the reinforced concrete foot-bridge constructed in the suburban district at James Park, Madison, N. J. One similar to this is in course of construction at Maple Avenue, East Orange, N. J. Fig. 21 shows the effective architectural treatment of this type of structure.

There were various farm crossings in the vicinity of Hackettstown that were spanned by bridges that required renewal, whereas the abutments were in good condition. To obviate the necessity of impeding traffic by falsework, the design was of the pre-cast type, the members being molded in Kingsland, transported to the site of the bridge and set in place in the interval between the passage of successive trains, Fig. 22.

Flat Top Undercrossings

Turning to the types used for the thickly populated districts like the cities on the line to Morristown through which the grade crossing elimination projects have been about completed, we find that since the eliminations consist of track elevation, the crossings are with very few exceptions undercrossings, which vary with the width of street. For a 50-ft. street, the bridge consists of two 24-ft. spans with a 2-ft. thickness of pier between. The pier has arched openings to permit of additional light. The bridge floor consists of simple concrete slabs spanning from pier to abutments. Fig. 23 shows a typical bridge of this kind.

An interesting example of this two-span type of bridge, but with smaller spans is the Punch Bowl bridge at Convent, N. J., Fig. 24. The street is 40 ft. wide so that with a 2-ft. 6-in. pier the clear openings are 18 ft. 9 in. each. The slabs were pre-cast and later set in place under traffic. There are really two bridges, one accommodating two railroad tracks and one for two tracks of the Morris County Railroad, which is a suburban street car line, the slabs for which are, therefore, lighter than for the railroad spans.

The architectural and structural features of this bridge



Fig. 17—A beautiful Structure at Dunmore, Pa., Embodying a Pleasing Combination of Construction Types

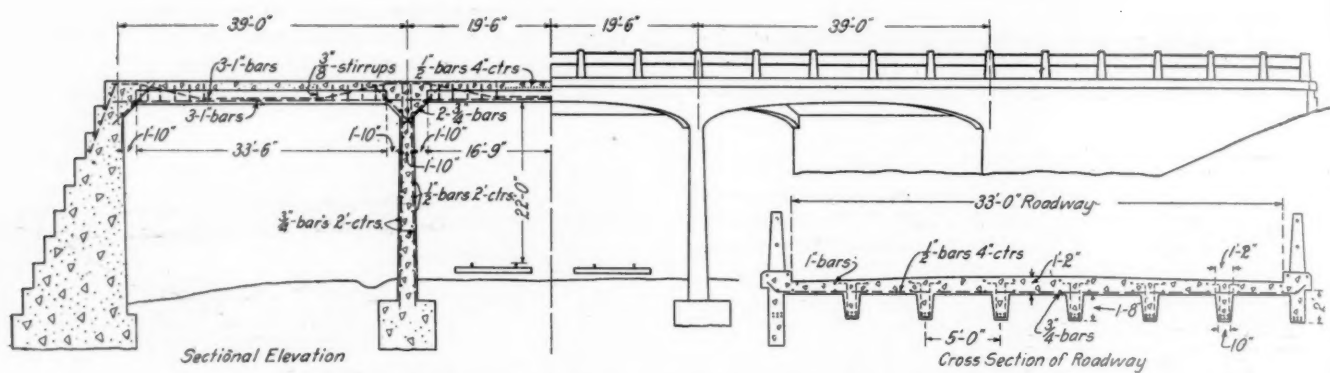


Fig. 18—T-Beam Construction May Be Treated to Give the Effect of a Flat Arch

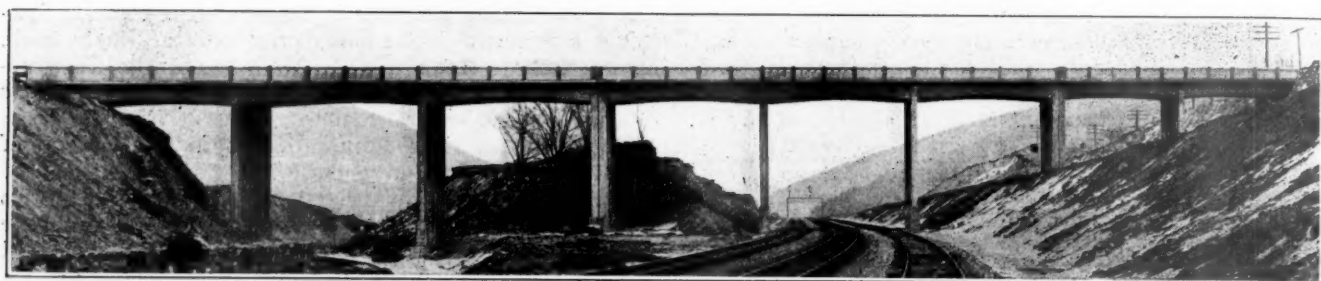


Fig. 19—An Example of T-Beam Construction in a Concrete Viaduct

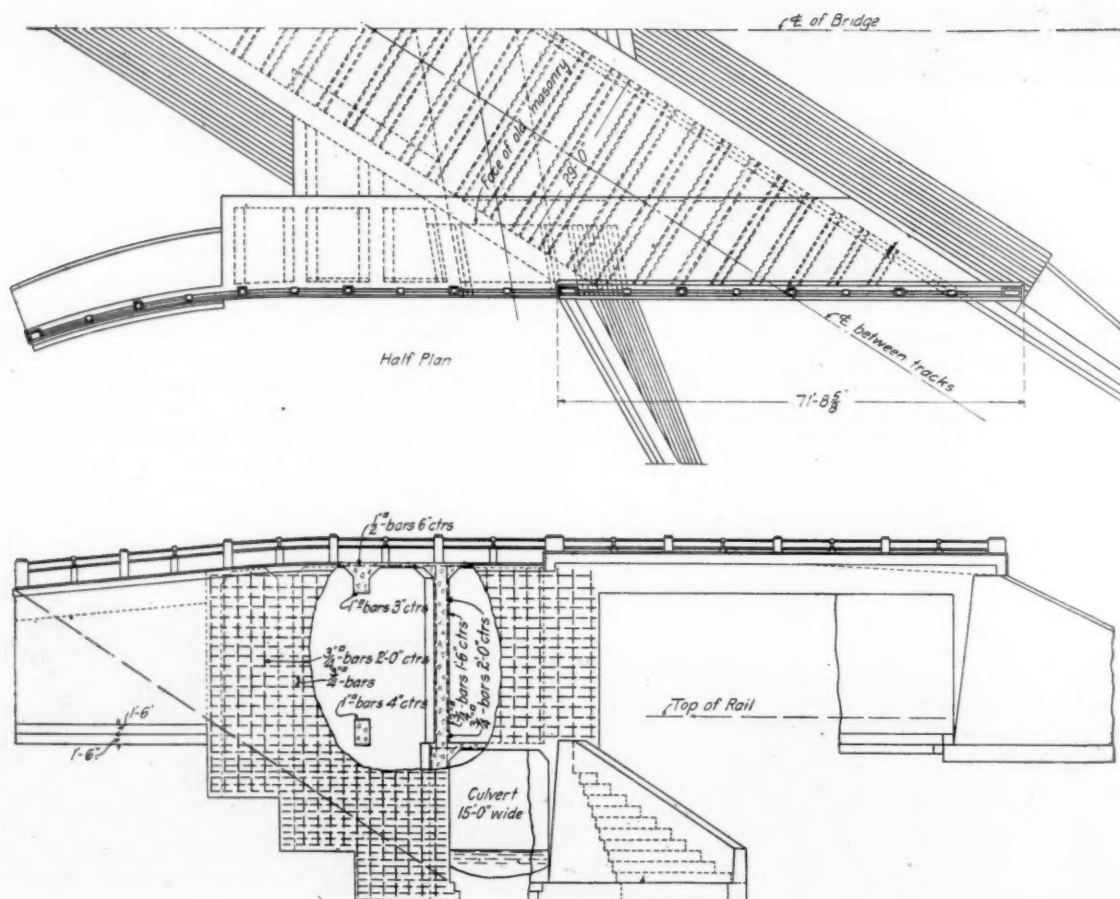


Fig. 20—A Complicated Skew Crossing at Montclair, N. J., Involving Cellular Construction in the Abutments

are the curved reinforced concrete wing walls which beautify the structure materially.

In the case of the 60-ft. streets it was necessary to resort to two types, one where it was permissible to locate a pier along the center line of street as well as along each of the curb lines and the other where it was imperative that the roadway be kept clear from curb to curb. In the first type,

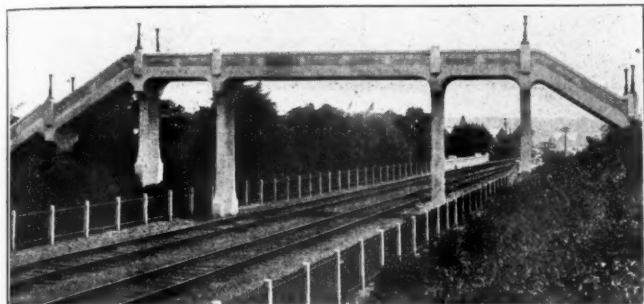


Fig. 21—An Unusual Treatment of a Foot Bridge with Excellent Results

a slab of varying thickness, depending on the relative length of roadway and sidewalk spans, is designed continuous from abutment to abutment over the intervening piers. As a rule the roadway spans are 17 ft. 6 in. clear, leaving 9 ft. 6 in. for clear sidewalk spans, and the reinforcement is carried normal to the pier lines so that where the angle of crossing is skewed the parapets act as fascia girders to carry the loading

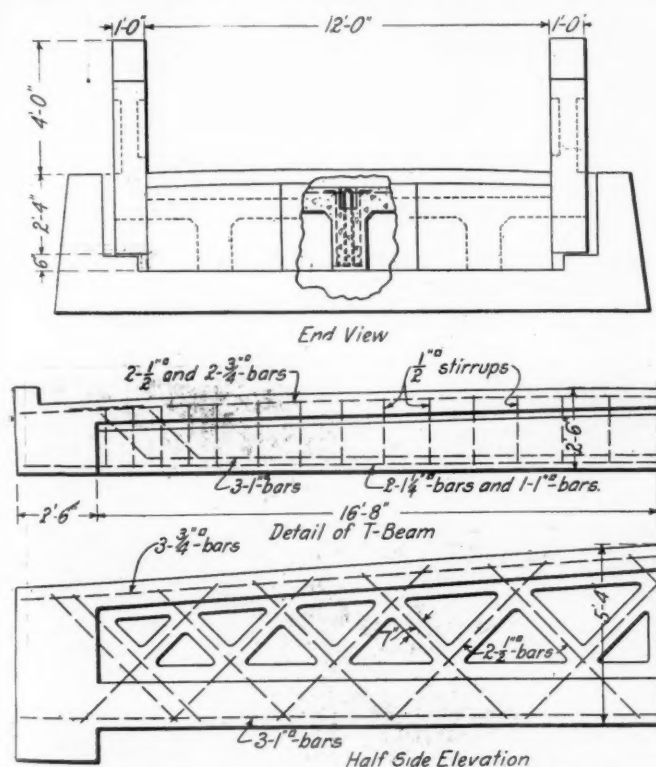


Fig. 22—Precast Unit-Construction Is Well Adapted to Locations Where Traffic Interferes with the Use of Falsework

transferred to them by the slab. The piers, two feet in thickness with arched openings, are carried on continuous footings. In some instances these bridges also carry station platforms which modify the design of the structure somewhat. Figure 25 shows a typical bridge for a 60-ft. street while Fig. 26 shows details of one at Lincoln avenue, Orange, N. J.

Madison Avenue bridge at Madison, N. J., is illustrated in Fig. 27, to show how advantage was taken architecturally of the large skew between the street and the track center lines to produce a structure of exceedingly pleasing appearance.

In the other type, where it was necessary to maintain a clear roadway, a span of 31 ft. clear had until recently been considered too large to permit the use of a reinforced concrete slab to take railroad loading, particularly in view of the limiting thickness of three feet for the depth of the slab. Recently, however, in the case of a bridge at Millburn, by the use of compressive reinforcement, a reinforced concrete slab three feet thick was installed for a 32-ft. clear span and may displace the design heretofore used which consists of I-beams imbedded in a solid concrete floor three feet thick, where the structural steel was figured to take the entire load.

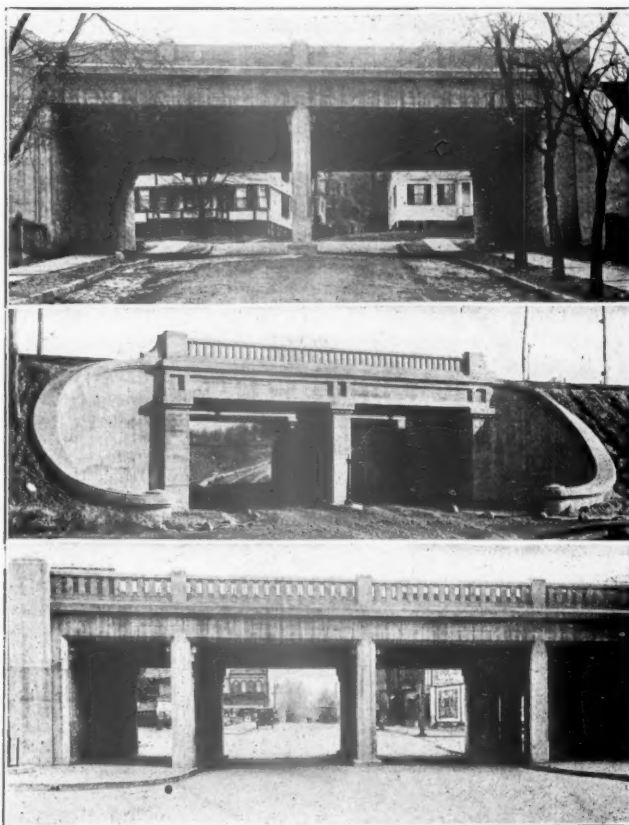


Fig. 23—Two-Span Crossing for a 50-ft. Street
Fig. 24—"Punch Bowl" Bridge with Curved Wingwalls
Fig. 25—A Four-Span Crossing for a 60-ft. Street

This slab is supported by box abutments enclosing the sidewalk spans as shown in Fig. 28.

Streets wider than 60 ft. are rare in suburban cities in the east, but they do occur. Sixteenth street and Fourth avenue, East Orange, are both 66-ft. streets and the side spans are then sufficiently long to permit the use of the four-way slab which was used on both of these bridges. Sixteenth street crosses the tracks at right angles while Fourth avenue crosses the tracks of the Montclair branch at quite a skewed angle, making the design considerably more complicated. The spans on the Fourth avenue bridge are irregular because of the different widths of sidewalks required for the two sides and because of the varying angle of skew of the two parapet faces caused by the location of the stairway from the station platform at one of the abutments.

Bridges for 100-ft. streets begin to partake of the nature of viaducts as expansion becomes a factor to be considered where structures exceed 100 ft. in length. At Madison, N. J., Green avenue is a 100-ft. street with 24-ft. 9-in. clear road-

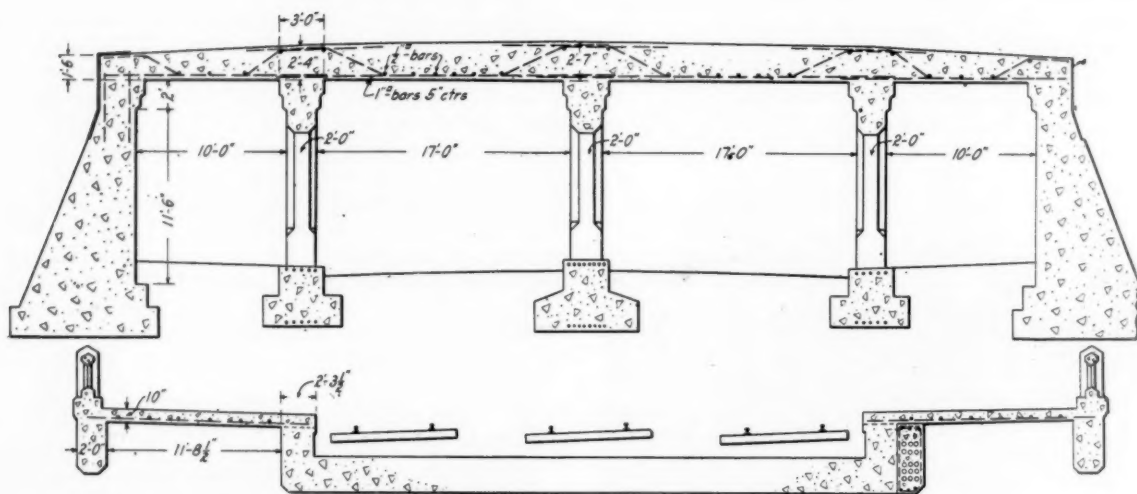


Fig. 26—Typical Details of a Reinforced Concrete Slab Subway Continuous Over Three Supports

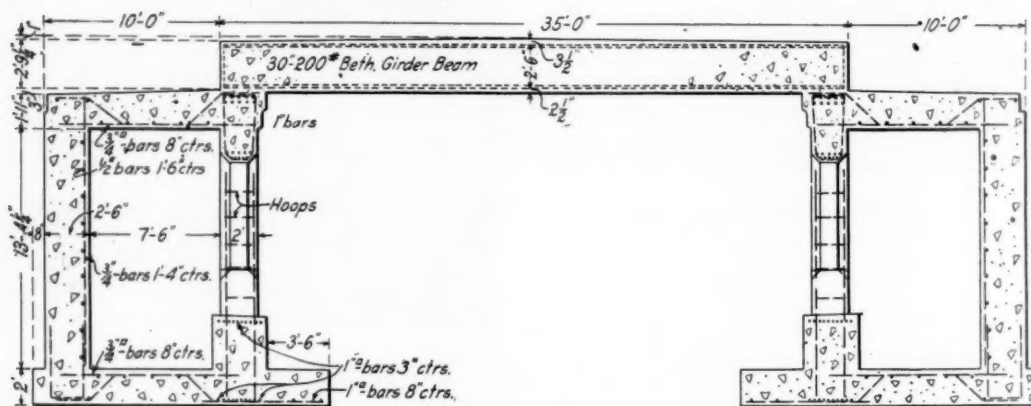


Fig. 28—An Example of Box Abutment Construction Enclosing the Sidewalk Spans



Examples of Two Subways for Wide Streets or Boulevards

Fig. 27—Madison Avenue at Madison, N. J.

Fig. 29—Subway for a 100-ft. Street at Green Avenue, Madison, N. J.

way spans, 21-ft. 6-in. clear sidewalk spans and 2-ft. 6-in. arched piers between, bridged over with a 3-ft. thickness of continuous slab from abutment to abutment, the parapets acting as girders to take the load due to the slight skew of the road with the center line of track, Fig. 29.

Another 100-ft. street occurs at Central avenue, Orange, N. J., where the four-way slab was used. While the main spans here are 28 ft. 8 in. center to center of columns the



Two Examples of Slab Construction for Street Subways

Fig. 30—A Four-Span Crossing of 100-ft. Street

Fig. 31—Subway with Center or Roadway Span Consisting of Steel Girders Encased with Concrete. The Side Spans Are of Reinforced Concrete

thickness of floor slab is only two feet, about one foot and a half less than would have been required for a continuous slab of that span with only one line of reinforcement. A feature of this bridge is the use of columns at the abutment lines with the slab cantilevered beyond, to preclude the



Fig. 32—Concrete Coal Pockets at Montclair, N. J.

sliding due to expansion which usually results in spalling at the abutments. The abutments were built around the columns and clear of both the columns and the slab. Figure 30 shows the appearance of the finished structure.

The Springdale avenue bridge on the Montclair branch of the East Orange improvements is another of the four-way slab bridges which is almost long enough to be classed as a viaduct. In fact it is a double crossing, providing two inde-

pendent roadways requiring a column spacing of 28 ft. center to center each, separated by two smaller spans and having sidewalk spans on either end. The total length of this bridge is 121 ft., end to end of slab.

Glenwood avenue at Bloomfield, N. J., is an example of a bridge with structural steel beams and girders entirely encased in concrete for the roadway spans, while the side spans are of concrete architecturally treated as to give the appearance of a homogeneous structure, Fig. 31.

In connection with various grade crossing elimination improvements, trestles were designed to accommodate sidings for industries adjacent to tracks. Fig. 32 shows the concrete coal pockets at Montclair.

Union Pacific Opposes Southern Pacific Application to Keep Central Pacific

WASHINGTON, D. C.

THE UNION PACIFIC moved promptly this week to meet the application filed with the Interstate Commerce Commission by the Southern Pacific for permission to retain control of the Central Pacific pending a determination by the commission of its disposition in the consolidation plan by filing a petition with the commission for leave to intervene in the proceedings on the Southern Pacific's application. The Union Pacific also filed a motion to dismiss the Southern Pacific application. An interesting feature of the case is that while the Southern Pacific has retained as one of its counsel in the case Max Thelen, former chairman of the California Railroad Commission, the list of Union Pacific counsel includes Edgar E. Clark, former chairman of the Interstate Commerce Commission, as a member of the firm of Clark & La Roe.

The Union Pacific motion to dismiss says that the commission is without jurisdiction to hear and determine the application of the Southern Pacific, that upon the facts and matters already before the commission, or of which it may take judicial notice, the application should be dismissed without the taking of testimony; and that in the exercise of its discretion and in recognition of the comity owed to the federal district court now having jurisdiction of the Southern Pacific-Central Pacific dissolution case, the application should not be entertained. The Union Pacific further moved that its motion be set down for oral argument before the full commission and that, pending the same and the decision of the commission thereon the commission and Division 4 postpone the taking of testimony either in support of or in opposition to the Southern Pacific application. A hearing on the latter had already been set for November 21.

The petition for leave to intervene states that the lines of the Central Pacific and of the Union Pacific together form a through transportation route between the Missouri river and San Francisco and other California points, and with the eastern connections of the Union Pacific constitute a direct transcontinental through route, and that by virtue of such connection and of its participation in such through route, the Union Pacific has an interest in the operation of the lines of the Central Pacific "independently of any control by interests hostile to said through route." It is also set forth that the railroads of intervenor and of the Central Pacific, together with the eastern connections at Council Bluffs and Kansas City, constitute the system of transportation through the Ogden gateway held by the United States Supreme Court in the decision of May 29, 1922, to be normally competitive with the southern routes of the Southern Pacific through the El Paso gateway, "which competition it is the purpose of the said decision of the United States Supreme Court to restore and protect." Some of the contentions made in the petition are:

Throughout the Pacific railroad acts, the lines to be con-

structed by the Union Pacific and the Central Pacific were treated in all respects as parts of a single project and it was specifically provided that the whole line should be operated and used, so far as the public and government are concerned, as one connected, continuous line. This requirement cannot be observed and fulfilled unless the Central Pacific is freed from the domination of the Southern Pacific "because the ownership and/or operation by the Southern Pacific Company of the southern routes through the El Paso gateway creates a primary interest on the part of the Southern Pacific Company in routes highly competitive with and hostile to the direct through transcontinental route formed by the railroads of the Central Pacific Railway Company and intervenor and their eastern connections."

"Upon the faith of the aforesaid requirement of the Pacific railroad acts, and, for the purpose of performing its part of the obligation imposed thereby and of handling efficiently and economically traffic to be routed over said through route and to be interchanged with the Central Pacific Railway Company at Ogden, intervenor has invested many millions of dollars in double-tracking 914 miles of the total 994 miles of its main line between Council Bluffs and Ogden and otherwise improving the same. Unless the statutory obligation shall be fulfilled on the part of the Central Pacific Railway Company or the interests controlling that company, the purpose of said acts will be violated, to the great detriment of interstate and foreign commerce and intervenor will suffer irreparable injury."

By virtue of these matters the Union Pacific said it had an interest in the execution of the mandate of the Supreme Court and in the adoption of a plan for accomplishing a severance of the control of the Central Pacific by the Southern Pacific which would leave the Central Pacific "free from domination by interests hostile to the Central Pacific-Union Pacific through route via Ogden and in all respects able to perform its part of the partnership obligation imposed by the Pacific railroad acts."

In conclusion the petition said that the mandate of the Supreme Court remands the case to the court for the district of Utah for further proceedings.

Car Service Division Orders Cars West

WASHINGTON, D. C.

IN ORDER to meet the demands of the farmers, the primary markets and the industries of the West, the Car Service Division of the American Railway Association on October 25 issued orders for a strenuous movement of cars of western line ownership into the western territory. This was done after urgent solicitation on the part of some western roads and representatives of shippers and state commissions. Effective at once and continuing until further notice all box cars except automobile cars belonging to the roads of the North Western, Central Western and South Western districts will be handled, according to the orders, as follows:

First: Eastern lines will discontinue all local loading of these cars and load them only to or beyond Chicago, Peoria, St. Louis or other western points from all territory east of Grand Rapids, Detroit, Pittsburgh and Wheeling, inclusive.

Second: Any cars for which through loading is not immediately available will be moved west empty.

Third: All loading at points west of Grand Rapids, Toledo, Pittsburgh, etc., will be discontinued and cars moved empty west for delivery to owning lines.

Fourth: Western line cars will be accepted at junction points from the East regardless of ownership and through route providing home route orders take the cars in the direction opposite from home.

It is believed that these instructions will have the effect of materially improving the car shortage condition in the West.

The Great Northern on October 19 filed a petition with the Interstate Commerce Commission asking it to exercise its emergency car service powers by issuing an order, without notice or hearing, requiring connecting lines to return to the Great Northern at the earliest possible time box, refrigerator and stock cars so as to enable it to haul grain, fruit, vegetables, live stock, lumber and coal that were being offered in greater quantities than could be handled. The commission declined to issue an order as requested, but set the petition for hearing on October 24. Before that date, however, the railroad withdrew the petition.

The Car Service Division has compiled the following report indicating the volume of transportation being handled by the railroads and showing loading for the week of October 14, with various comparisons:

| TOTAL CAR LOADING ALL CLASSES OF TRAFFIC | | | | |
|--|---------|---------|----------|----------|
| Week ending | 1921 | 1922 | Increase | Per cent |
| Aug. 19 | 815,147 | 856,219 | 41,072 | 5.0 |
| Aug. 26 | 828,883 | 890,838 | 61,955 | 7.5 |
| Sept. 2 | 831,288 | 931,598 | 100,310 | 12.1 |
| Sept. 9 | 749,552 | 832,744 | 83,192 | 11.1 |
| Sept. 16 | 852,552 | 945,919 | 93,367 | 11.0 |
| Sept. 23 | 873,641 | 973,291 | 99,650 | 11.4 |
| Sept. 30 | 904,831 | 988,381 | 83,550 | 9.2 |
| Oct. 7 | 899,681 | 968,169 | 68,488 | 7.6 |
| Oct. 14 | 910,529 | 983,470 | 72,941 | 8.0 |

| GRAIN AND GRAIN PRODUCTS LOADING | | | | |
|----------------------------------|--------|--------|----------|----------|
| Week Ending | 1921 | 1922 | Decrease | Per cent |
| Aug. 19 | 60,066 | 55,893 | 4,173 | 6.9 |
| Aug. 26 | 58,838 | 54,562 | 4,276 | 7.3 |
| Sept. 2 | 60,279 | 54,019 | 6,260 | 10.4 |
| Sept. 9 | 54,964 | 47,732 | 7,232 | 13.2 |
| Sept. 16 | 55,170 | 52,090 | 3,080 | 5.6 |
| Sept. 23 | 52,906 | 52,379 | 527 | .9 |
| Sept. 30 | 57,222 | 52,129 | 5,093 | 8.9 |
| Oct. 7 | 54,457 | 50,553 | 3,904 | 7.2 |
| Oct. 14 | 47,847 | 52,492 | 4,645 | 9.7 |

| LIVE STOCK LOADING | | | | |
|--------------------|--------|--------|----------|----------|
| Week ending | 1921 | 1922 | Increase | Per cent |
| Aug. 19 | 28,499 | 29,756 | 1,257 | 4.4 |
| Aug. 26 | 26,919 | 32,046 | 5,127 | 19.0 |
| Sept. 2 | 27,273 | 31,847 | 4,574 | 16.8 |
| Sept. 9 | 24,700 | 29,512 | 4,812 | 19.5 |
| Sept. 16 | 30,098 | 34,929 | 4,831 | 16.1 |
| Sept. 23 | 32,769 | 36,896 | 4,127 | 12.6 |
| Sept. 30 | 32,979 | 39,830 | 6,851 | 20.8 |
| Oct. 7 | 33,767 | 39,359 | 5,592 | 16.6 |
| Oct. 14 | 36,009 | 39,141 | 3,132 | 8.7 |

| COAL LOADING | | | | |
|----------------|---------|---------|-------------|----------|
| Week Ending | 1921 | 1922 | Decrease | Per cent |
| Aug. 19 | 152,513 | 81,959 | 70,554 | 46.3 |
| Aug. 26 | 159,513 | 111,030 | 48,483 | 30.4 |
| Sept. 2 | 154,586 | 149,487 | 5,099 | 3.3 |
| Sept. 9 | 142,148 | 139,570 | 2,578 | 1.8 |
| Sept. 16 | 165,511 | 172,241 | 6,730 Inc. | 4.1 |
| Sept. 23 | 170,156 | 187,896 | 17,740 Inc. | 10.4 |
| Sept. 30 | 180,354 | 189,349 | 8,995 Inc. | 5.0 |
| Oct. 7 | 182,595 | 189,312 | 6,717 Inc. | 3.7 |
| Oct. 14 | 195,547 | 196,926 | 1,379 Inc. | .7 |

| SURPLUS SERVICEABLE CARS ON HAND | | | | | | |
|----------------------------------|-------|---------|----------|--------|-------|---------|
| | | | Shortage | | | |
| Week Ending | 1920 | 1921 | 1922 | 1920 | 1921 | 1922 |
| Aug. 15 | 1,782 | 284,338 | 140,253 | ..... | ..... | ..... |
| Aug. 23 | 1,267 | 270,024 | 120,961 | ..... | ..... | ..... |
| Aug. 31 | 1,022 | 246,740 | 70,455 | ..... | ..... | ..... |
| Sept. 8 | 769 | 237,972 | 43,168 | ..... | ..... | ..... |
| Sept. 15 | 5,045 | 219,991 | 22,969 | 96,114 | 724 | 85,906 |
| Sept. 23 | 4,965 | 201,153 | 11,292 | 89,947 | 1,470 | 107,666 |
| Sept. 30 | 1,916 | 172,420 | 5,843 | 80,141 | 3,321 | 130,325 |
| Oct. 8 | 1,928 | 142,970 | 5,500 | 75,336 | 5,237 | 141,252 |
| Oct. 15 | 2,188 | 121,944 | 4,275 | 69,517 | 3,683 | 156,309 |

| CARS MOVED | | | | |
|--|---------|---------|---------|--|
| Reports of 55 railroads show cars moved during the period from September 9 as follows: | | | | |
| 1922 | Loads | Empties | Total | |
| Sept. 9 | 484,813 | 198,856 | 683,669 | |
| Sept. 13 | 548,532 | 240,957 | 789,489 | |
| Sept. 16 | 510,981 | 214,555 | 725,536 | |
| Sept. 20 | 559,237 | 247,679 | 806,916 | |
| Sept. 23 | 539,988 | 223,393 | 763,381 | |
| Sept. 27 | 582,082 | 251,584 | 833,666 | |
| Oct. 4 | 591,953 | 257,132 | 849,085 | |
| Oct. 11 | 588,064 | 267,805 | 855,869 | |
| Oct. 18 | 586,346 | 273,514 | 859,860 | |

| CARS MOVED | | | |
|--|--------|---------|--------|
| Reports made semi-weekly by 55 representative railroads show average number of cars moved per railroad per day as follows: | | | |
| | Loads | Empties | Total |
| April, 1922 | 4,132 | 4,132 | 11,770 |
| May, 1922 | 8,178 | 4,290 | 12,468 |
| June, 1922 | 8,604 | 4,596 | 13,200 |
| July, 1922 | 7,914 | 3,645 | 11,559 |
| August, 1922 | 8,631 | 3,789 | 12,420 |
| September, 1922 | 9,901 | 4,248 | 14,149 |
| October 11, 1922 | 11,096 | 5,053 | 16,149 |
| October 18, 1922 | 11,063 | 5,161 | 16,224 |

Railway Fire Protection—Ninth Annual Meeting

Details of Varied Fire Risks—The Dangerous Cigarette— Fire Prevention Week—Hose Couplings

THE FIRST DAY'S proceedings of the annual meeting of the Railway Fire Protection Association at Washington last week were reported in the *Railway Age* of October 21, page 745.

The first report on Wednesday, the second day, was that of the committee on the use of gasoline trucks in freight stations, E. J. Reilly (Erie), chairman. Mr. Reilly had no written report, but asked numerous questions. The use of gasoline tractors in freight houses is being tried cautiously in a few places, because of the high cost of electric tractors, but every fire insurance man is, as a matter of course, reluctant to approve them. Gasoline tractors are declared also to be cheaper to operate and maintain. Gasoline (street) trucks have been freely admitted to New York City freight piers for years, on the ground floor, and it was the general feeling of the meeting that the railroads will eventually have to withdraw or modify their objections. It is taken for granted that the underwriters will insist that gasoline trucks used in freight stations be always stored outside the building. The Southern Pacific, at Galveston, Tex., uses some gasoline tractors on its piers, which have concrete floors. The gasoline supply is a mile away. A special muffler is used and inspection is rigid.

The Cleveland, Cincinnati, Chicago & St. Louis is trying these tractors. The Illinois Central uses electric tractors on its long pier at New Orleans and G. R. Hurd, of that road, believed gasoline could not be thought of for that service. Cotton is a principal commodity handled there. Mr. Reilly said that in Erie stations, at New York, barrels of sand for extinguishing gasoline fires had been maintained for a dozen years, but there had never been occasion to use them.

This committee was continued for another year.

The United States Chamber of Commerce and its activities were described to the members by J. L. Madden, manager of its fire prevention activities. His first general survey was finished last August and has shown definite good results. Mayors, governors and even the President of the United States have been exhorted in connection with Fire Prevention Week. Following Mr. Madden's address it was resolved that every member ought to co-operate with the United States Chamber and also with local chambers of commerce and any local power that can do good work in fire prevention.

The Question Box

Miscellaneous questions, brought together since the meeting opened, occupied the members for an hour. One of the most interesting of these was that concerning the rule prohibiting smoking. The labor troubles of the past four months have caused a good deal of disturbance of this rule. Many temporary dormitories have had to be maintained. The self-sustaining cigarette was declared to be one of the worst fire hazards. An appeal was made to members to work for the condemnation of all cigarettes but those in which, as in cigars, the fire goes out when the cigarette is abandoned. Shopmen should be allowed, at noon-time, to smoke; but only in designated places looked after by a caretaker. Fire inspectors should never smoke on railroad premises, even where smoking is not forbidden specifically. To cut down smoking, begin at the top. If a station agent smokes there can be no effective discipline of his subordinates.

Risks of fusees were briefly discussed. Dampness is the principal danger to be guarded against in that direction, though one member said that the best kinds now made do not suffer from dampness.

W. T. Krausch (C. B. & Q.) spoke briefly of the recent burning of the Burlington general office building in Chicago. The vaults, with walls 13 in. thick, functioned perfectly. The Burlington is going to provide portable steel cases for drawings which cannot be kept in vaults. B. S. Mace (B. & O.) called attention to the importance of protecting records at other places than headquarters; for example, at freight junction points. Every division of the road should have one fireproof place for records.

The use of radio telephone receivers was discussed briefly. Some members described damage that had been reported, but the majority seemed to think the fire hazard very small. The United States Steel Corporation found 5,600 radio sets in use in its numerous buildings.

Addresses by Messrs. Kimball and Fleming

L. P. Kimball, engineer of buildings of the Baltimore & Ohio, read a paper on co-operation between his department and the fire protection men. Everyone agrees that such co-operation is desirable, but the speaker's emphasis was on the importance of acting together before, instead of after, the building of any structure. He cited an instance of two similar structures, built about the same time, one of which costs for fire insurance \$16,000 yearly more than the other, because the designers did not consult the insurance men.

T. Alfred Fleming, representing the National Board of Fire Underwriters, who had been chairman of a committee to carry on "Fire Prevention Week," gave a glowing account of the success of that enterprise. Messages of wisdom on fire prevention were sent out by 227 radio stations and were advertised by 1,400 Rotary clubs, 1,000 Kiwanis clubs and hundreds of other organizations.

Oxy-Acetylene Apparatus in Shops

The committee on safety in the use of oxy-acetylene welding and cutting presented a printed report of 18 pages, made up of a most elaborate code of rules for the guidance of everybody from the purchaser of apparatus to the last detail of inspection, and four pages of rules for shop workmen. The report was read by the chairman, G. A. Hays (U. S. Steel Corp.), and was discussed at some length. On a number of points differences of opinion proved to be marked and the report was referred to the executive committee, being accepted as in the nature of a progress report. One member proposes to put yellow flags on portable shop apparatus.

Fire Protection Views of an Engineer of Buildings

W. T. Krausch, engineer of buildings of the Chicago, Burlington & Quincy, read a paper on protection as looked at from his department, especially in relation to repaired or altered buildings. He outlined the best methods of renovating a frame station. He gave a condensed pen picture of the policy of the Burlington road in fire protection. Reports received from the insurance companies or brokers are dealt with at officers' meetings, thus avoiding the delays incident to correspondence with various departments. Officers of the road when on inspection trips must keep their eyes open and report to the fire department everything needing that department's attention.

Oil on Water

W. F. Steffens (N. Y. C.) read the brief report of a committee on fuel oil on water. Violations of law by oil-burning boats which waste their oil refuse on the surface of New

York and other harbors have been largely abated. This oil or emulsion is likely to remain in a harbor a long time and the evil demands persistent attention. This committee has conferred with the New York Fire Underwriters' Association and others, and had almost prepared for careful chemical experiments when its work was suspended by reason of the railroad shopmen's strike. The National Fire Protection Association has a committee on docks which also is studying the oil-on-water problem.

A Specialist in Railroad Records

Wednesday's session was closed with a brief address by E. M. Hawes of the Safe Cabinet Company, Marietta, Ohio, advocating the use of fireproof fittings and delineating vividly the annoying and costly experiences of railroad officers whose records have been destroyed in conflagrations. Illustrating by the recent Burlington office fire in Chicago, the speaker showed the inaccurate and often false use of the term "fireproof." Sixty per cent of iron safes fail when tested by a large fire. The Burlington's vaults stood the test; but the walls of many vaults are only two-thirds as thick as these.

Standard Hose Couplings

The first business on Thursday was the reading of a report by a committee, F. H. Elmore, chairman, on the Development and Use of National Standard Couplings for Fire Hydrants and Hose. Compiling data received from eight railroads, the committee finds that 92 per cent of the couplings can be standardized and that only three per cent would have to be replaced in adopting the national standards. The National Board is making some progress in standardization. A set of standardization tools can be had for \$200 from the Greenfield Tap & Die Corporation, Greenfield, Mass. Railroads feel a drawback in their attempt to adopt national standards because their apparatus must be uniform with that of the city or town in which it is situated and many of the towns are not progressive. New York City, notably, has a standard different from the national. Some roads have made use of "adapters" for making it possible to use diverse sizes of couplings. Standardization can be facilitated by communicating with the National Board of Fire Underwriters, which will furnish paper strips to put around the threading of a coupler and make an impression with which to report sizes of couplings at the different locations. The paper, however, if used on a badly worn coupling might in some cases give a deceptive result.

This report was intended mainly to promote discussion among members during the ensuing months and was accepted as a progress report.

Dust in Grain Elevators

A. R. Small, vice-president of the Underwriters' Laboratories, Chicago, read an address on The Control of Dust in Grain Elevators. Two courses are always to be considered: (1) Remove the dust from the grain; (2) confine the dust in the grain. Removing it is objected to by farmers and others on the claim that good grain is also removed, some objectors going to the extent of alleging theft of grain. To confine the dust in the grain seems almost impossible; but the flour mills have had success in this line and their experience for 30 years should teach grain elevator men that dust can be controlled. For 40 years there has been no serious explosion in a flour mill. A principal safeguard is to provide that air currents shall flow into the chutes, not out of them.

This paper was followed by a long discussion covering many details of the subject. A large elevator at Chicago has a vacuum cleaning system which has displaced 40 or 50 men who formerly were employed as sweepers, but the discussion seemed to indicate that the superiority of the vacuum system, for general use, has not yet been demonstrated. The high

standards set forth by Mr. Small in his paper were generally looked upon as suitable and highly desirable when designing new elevators, but difficult of application to old ones. Mention was made of the fact that with the latest forms of machinery the costly safeguards are needed because these machines operate at perhaps 10 times the speed of older designs. The National Fire Protection Association is working on a standard for machinery used in elevators.

Timber-Treating Plants

L. F. Shedd (C. R. I. & P.), chairman of a special committee on Fire Prevention at Timber Treating Plants, read a report, detailing under 14 heads the principles to be followed and the rules needed for the thorough protection of such treating plants. This paper was not discussed, the aim of the committee having been to prepare a complete and detailed code of rules for the consideration of members between now and the next meeting of the Association.

Mr. Shedd's report ended the list of formal papers and some time was spent in informal discussion of miscellaneous matters. Serious fires started by the ignition of locomotive cab curtains by men using torches were briefly discussed.

A meeting held some weeks ago by eastern members was spoken of as a great success and Robert Scott (A. C. L.), expressed the intention of starting a movement for holding district meetings in the south. A proposal to amend the constitution so that members of the executive committee could not hold office for more than one term at a time was discussed for some time but finally was voted down. In practice the rule of rotation in office has been pretty generally followed, so that any objection to individuals remaining in office too long was looked upon as theoretical only.

The officers chosen for the ensuing year are: President, E. A. Ryder (B. & M.), Boston; vice-president, George R. Hurd (Illinois Central), Chicago; secretary and treasurer, R. R. Hackett (B. & O.), Baltimore. Members of the executive committee: C. J. Parker (N. Y. C.), New York City; J. R. Peters (Penn.), Philadelphia, and W. S. Topping, Bureau of Explosives, New York City. The retiring members are R. H. Newbern and G. R. Hurd.

The Foamite Firefoam Company gave a motion picture exhibition of the use of its suds for extinguishing oil fires, including an actual conflagration at a large oil tank farm in Wyoming. This was the only exhibit in connection with the meeting, although the Pyrene Manufacturing Company had a display in the hotel and the Simplex hydrant was demonstrated for members at a point outside.



International

Batignolles Tunnel, Paris, Where Many Accidents Have Occurred, Being Converted into an Open Cut

Railway Treasury Officers Meet At Asheville, N. C.

Railroad Financing, Mechanical Devices and Cash Payment of Freight Bills Leading Topics of Discussion

THE RAILWAY Treasury Officers' Association held its sixteenth annual meeting at the Battery Park Hotel, Asheville, N. C., October 19 and 20. Besides the regular business of the association, papers were read by F. L. Paetzold, secretary and treasury of the Great Northern, on the subject of "Mechanical Devices in the Treasury Department;" by T. H. B. McKnight, treasurer of the Pennsylvania Railroad, on "Railroad Bonds as an Investment;" by E. L. Copeland, treasurer of the Atchison, Topeka & Santa Fe, on "The Transportation Act and the Treasury Department." A report was also presented on, "How Shall Essential Uniform Observance of the Rules Governing the Collection of Transportation Charges be Attained?" It was prepared by A. T. Bayfield, treasurer of the Lehigh Valley; W. J. Moody, treasurer of the Erie, and F. T. Dickerson, treasurer of the Central of New Jersey.

The president of the Association for the past year was D. K. Kellogg, treasurer of the Richmond, Fredericksburg & Potomac. New officers elected for the ensuing year are: President, W. F. Ingram, treasurer of the Southern Pacific; vice-president, J. F. Fahnestock, treasurer, Pennsylvania Railroad; second vice-president, J. T. Reid, treasurer, Atlantic Coast Line, and secretary and treasurer L. W. Cox, who is assistant secretary of the Norfolk & Western with office at 1217 Commercial Trust Building, Philadelphia, Pa. Members of the executive committee were elected as follows: A. B. Jones, (C. & N. W.); R. N. Harry, (C. C. C. & St. L.); J. A. Yates, (G. T.); A. F. Bayfield, (L. V.); J. P. Reeves, (C. & E. I.); F. T. Dickerson, (C. R. R. N. J.).

Railroad Bonds as Investments

By T. H. B. McKnight

Treasurer, Pennsylvania Railroad, Pittsburgh, Pa.

We railroad men are not in the habit of looking at railroad bonds as investments—at least not nearly so much as might be wished—but rather as the means by which money may be obtained for construction, equipment, improvements and refunding of maturing prior obligations.

When the first railroads were begun their projectors had but slight knowledge of what sums would be required to construct even the small local roads they had in view, and expected the financing to be made entirely from stock sold to the people in the proposed terminals or along the line of the road who naturally hoped to be benefited by the construction of the railway to serve them by carrying their products to the markets and bringing to them such supplies as they had to procure from a distance. The reason for their subscription toward the stock of the new company was hardly to make an investment, but rather to expend money to secure the benefits which would come to them from having cheap and rapid transportation. Owing to ignorance of what it would cost to construct a practical railway ready for operation, the amount required far exceeded expectations and repeated stock issues were necessary and finally failed to bring any additional funds. To attract more money it soon became necessary to make the investment more secure, and preferred shares were issued, giving the new subscribers a preference over the earlier ones, both in dividends and as to division of the assets in the event of liquidation. This increased security, however, failed to procure all the money required and it was necessary to borrow money on the only security generally known in those days—a mortgage on the

property—and bonds were issued, but always in sums insufficient to complete the property for operation, so that one issue followed another, each junior in lien to those that preceded it. There were first, second, third and fourth mortgages on the same property; and then came income bonds, when there was nothing else left to mortgage.

It is interesting to note that during these early years when these bonds were going out in successive series, the railroads always seemed to cherish the hope that somehow, somehow, they would be able to pay the mortgage debts off, and elaborate sinking funds were provided for out of future earnings to retire enough bonds each year to extinguish the loan at maturity. The earlier railroad builders seemed to have uniformly been of a hopeful and optimistic temperament!

Very few of these early hopes were gratified by fruition and most of the investors in the bonds and practically all of the original projectors of the railroads lost all the money that they put into the enterprise, though some of the owners of the first mortgage bonds may still, in a reduced amount, have an interest in the stock of the present corporations.

Three Periods

Railroad bonds may roughly be divided into those issued in three periods:

I. *Construction*: Practically all of these bonds were extinguished by foreclosures, the first mortgage bonds sometimes receiving stock in the new corporation, only to be wiped out later by a foreclosure of later bond issues. Those that were not foreclosed were paid at maturity or refunded. These bonds generally carried 6 to 8 per cent, for money was not so plentiful in those days and interest rates were higher.

II. *Growth and Prosperity*: Many of the bonds issued by the stronger roads during this period, which lasted up to about 15 to 20 years ago, are still outstanding and are the best of investments, because the railroad people were still entirely unable to realize the expenditure that would be required in the years to come, and hence put out comparatively small issues, so limited that, when the bonds authorized under that mortgage had been sold, future issues had to be made, which were of course junior liens. From force of habit and with the idea that it improved the sale of the bonds many of these issues had sinking fund provisions that are proving very embarrassing to the present corporations, which have to borrow money on junior loans at higher rates for betterments while much of their income must be applied to buying in low-rate prior lien bonds at exorbitant prices.

III. *Government Interference*: With the gradually increasing domination of the Interstate Commerce Commission and its mistaken policy of steadily reducing traffic charges, notwithstanding that growing operating expenses were every year as steadily reducing the margin of profit, it became difficult and finally almost impossible for the railroads to finance necessary but non-productive betterments, such as elevation of crossings, out of net earnings, as had been the proper method for years, or to provide for productive additions and improvements by sale of capital stock, and forced them to provide the money needed for all purposes by sale of bonds, which were necessarily of inferior lien and were known as consolidated, general or refunding bonds. By this time too the railroad officers began to get a vision of the vast expansion of facilities that would be required to perform the service to the public that would be needed in the not very far distant future, so that these mortgages, though limited at first to definite totals, yet permitted so large an issue that they may be called "blanket mortgages" as they cover all the property "now held or hereafter to be acquired."

Comparatively recently mortgages are being put on the property with no limit as to the amount of bonds that may be outstanding thereunder except one based on the amount of capital stock outstanding; for example, in recent mortgages of two of our greatest companies, the provision is that the bonds outstanding under the mortgage and prior ones

must never be more than three times the amount of the capital stock! In such mortgages too the issue of bonds may only be made for betterments or property acquired or for refunding prior liens. These mortgages are the final ones, because they are practically without limit, they will never be exhausted, as when the early series of bonds mature later series will be issued under the same mortgage to refund them and to pay for additional betterments.

Partly because of these blanket mortgages a new form of security has been and is being very largely issued—equipment trust certificates—which are mortgages placed on new equipment before they pass into the ownership of the railroad and under its mortgage, or, as in the Philadelphia plan, where the title to the equipment remains in a trustee until the railroad has paid the cost, over a series of 10 or 15 years.

Value as Investments

To value these various bonds as investments, it is necessary to consider the security of each class and what may happen in the 40 to 100 years which they have to run before the principal comes due. As practically none of the bonds issued during the period of construction remain outstanding now, we can omit any further reference to them.

The bonds of the period of growth and prosperity are outstanding in large amounts at prices based on the prevailing rate of interest. As many of them were issued at $3\frac{1}{2}$ or 4 per cent they have sold very low during this war period of high interest rates but are now coming back to their own again. As these issues are limited in amount and no more can now be issued, they are, when the obligations of standard, well managed, dividend paying roads, very safe investments, and should steadily get better in security as prior liens are paid off and more value added to the property by improvements and betterments placed out of proceeds of stock or bonds of subsequent liens.

It is difficult to imagine anything that could make these prior lien limited issue bonds of a good road unsafe: Even if the radicals ever achieve their fondest hopes and the government takes over the railroads, it is inconceivable that they should not do so by purchase at an appraised value and these earlier bonds must then certainly receive their full par values.

When we come to the blanket or unlimited issues recently made in the period of government interference, it can only be said that the security of the bonds will depend very much on the amount issued, the prosperity of the road and the good or bad judgment displayed by the management in placing additions or extensions on the property. One large road has a blanket mortgage which permits the issue of bonds for the full cost of branches; and as it lies in a coal country the terms of the mortgage would permit the issuance of long term bonds for cost of branches to mines which would be worthless after the coal was exhausted—long before the maturity of the bonds. The purchase or construction out of bonds of a large extension which might prove unprofitable might seriously depreciate the value of the blanket bonds but could not in any way affect the value of the prior lien bonds.

There are now on the market so many good bonds of public service and industrial corporations which are well secured that a prudent investor will be inclined to diversify his investment. These latter bonds generally contain the provision that additional bonds can be issued under the mortgage only to refund prior lien bonds or for betterments at a certain percentage of their cost—generally 80 per cent—and then only when the income for a period of years has averaged three times the interest on all the bonds, including the new issue. Some such provision as this might well be inserted in the blanket mortgages of the railroad companies and would decidedly increase the security of the bonds.

As long as railroad bonds of limited issue can be had the careful investor will naturally prefer them for investment of trust funds in his care, and in fact in many states he could not invest such funds in these new unlimited blanket mortgages until the prior lien bonds have been retired.

Equipment trust securities, especially on the Philadelphia plan, issued by a well managed, prosperous road that keeps its equipment in good repair, are about as safe as anything one can imagine, though they are generally of short term. As they start with a margin of safety of 15 to 25 per cent and are retired faster than the equipment deteriorates, and as equipment is always in demand if the certificate holders have to take it over, these certificates ought to be absolutely secure.

The careful investor will probably consider the various conditions surrounding the properties whose bonds are offered to him and the possibilities of future improvement or deterioration, and will naturally diversify his holdings by buying not too many of one kind of security, or of one company or one region, so that his chances of serious losses will be reduced to a minimum. He will of course have in mind the fact that all corporate bonds are subject to government influences, but he will find so few investments to which this does not apply in one way or another that he will have to decide that he cannot entirely avoid this danger but will have to assume it, and can only minimize it by scattering his purchases. He will also probably feel that there are very few corporations more carefully and honestly managed than the railroads, and none as to which such full and accurate information may be obtained, and in the future as in the past, well secured bonds of well managed corporations will be found to form a substantial part of all large funds, such as are carried by insurance companies, colleges, and endowed institutions of all kinds, and of the contents of the strong-boxes of wealthy individuals.

The investor should remember too that the priority of a security does not always make it safe—a general mortgage bond of a prosperous corporation whose property is well located may be much safer than a first mortgage bond of a less prosperous concern.

The tendency of the courts to continue receiverships indefinitely and to permit receivers' certificates to be issued and placed ahead of even the first mortgage does not make toward the security of railroad bonds of prior lien and has resulted sometimes to their great damage, but it really seems as if this practice has about reached its limit—at least we can hope so.

The Transportation Act and the Treasury Department

By E. L. Copeland

Secretary and Treasurer, Atchison, Topeka & Santa Fe

(Mr. Copeland's paper was in the form of a somewhat detailed analysis of the changes in railway regulation embodied in the Transportation Act. Concerning more particularly the treasury department he spoke in part as follows:)

During federal control the services of soliciting agents had been dispensed with. Freight cars for use of all lines had been distributed over the country as business demanded, and it practically made no difference what line secured the business relative to the earnings, as it was all federal. On the return of the railroads to the owners it was fully realized by all that competition for business would be as keen as ever. Under this situation, and with the treasury of the various lines in a cramped condition from lack of funds, it was important that some action should be taken relative to the payment of all transportation charges on a cash basis.

Advantage had been taken of the railroads by many large

shippers prior to federal control, in order to secure a concession in the time required for the settlement of transportation charges, and unusual credit had been extended. The tariff charges to be assessed were declared as on a cash basis rather than a time period. In a hearing before the Interstate Commerce Commission some shippers thought that they should be given 15 to 30 days' credit, but Congress realized the injustice of such a plan, and determined that the service performed by the transportation companies should be paid for before the relinquishment of the freight, leaving it to the commission to establish such rules and regulations as would be consistent with good business requirements.

This conclusion was a fortunate one for the treasury departments of the railroads, assuring them that unlimited credit, delays in settlement, etc., would not be permitted under this law. In the general discussion of this subject it was clearly indicated by the members of Congress, that no industrial or mercantile line of trade should be permitted to transact business on railroad money, as that is practically the situation whenever an extended credit is permitted to railroad patrons.

The treasury department controls the collection of revenue and is expected to take care of the varying conditions relative to the delivery of all shipments, perishable or otherwise. The Interstate Commerce Commission has left the detailed requirements to the railroad treasurers, who are in close touch with the situation, and it placed a responsibility on them greater than ever before. Treasurers must know more about the financial responsibility of their patrons at all points on their line; they must avoid discrimination and at the same time recognize the importance of expanding the method of collection as the various lines of business may require. The iron-clad rules must be elastic in various ways. The handling of perishable freight must receive special attention; diversion and delivery of shippers order shipments, without surrender of original bills of lading must be fully protected; congestion of freight must be avoided by arranging for prompt switching and unloading of cars for further service.

I am enumerating a few of the things that the treasury department must handle without fear or favor. After much discussion, the Interstate Commerce Commission decided that exceptions could be made in the collection of transportation charges to well-known, financially responsible patrons, who would agree to pay the bills within 48 hours after presentation, and that where special conditions were such that additional credit should be extended, on the filing of proper bond with the treasury department, a credit of 96 hours could be extended from the time of presentation of the freight bills. This arrangement places the treasury department in close relation with the shipping public, and it is expected to keep posted as to the financial condition and the ability of parties to make settlement within the stipulated time.

These requirements of the commission are well known and have been published for the benefit of all shippers, but there seems to be a feeling that the railroads now being operated by their owners should extend ordinary business courtesies to patrons and permit them to settle the bills at such times as they desire. The treasurers of the railroads should realize that competition is very keen and readily see that the permitting of such delays would soon cause a large uncollected list of bills to report weekly, and at the close of each month. If continued, we would soon be drifting back to old conditions which existed prior to federal control.

I understand that the treasury departments of several lines are quite careless in this respect and refuse to join with other lines in removing delinquent patrons from the credit list. We shall never be able to force obedience to these rules if we permit a continuation of this condition, and I think the treasury department should decide that the rules must be enforced, and parties not making payments promptly should be eliminated from the accommodation list. Without

this co-operation there is but one solution of this entire situation, and that is the establishment of railroad clearing house associations. These organizations are now in operation at Kansas City and St. Joseph, Mo., and we have no trouble at these points to make uniform collections from all patrons.

I would suggest that a survey be made by the treasurer of each railroad as to the cost of handling collections in all large cities, and when this has been secured, estimate the expenditure of a clearing house as operated on the Kansas City plan, and determine as far as possible which system would be the more economical. When you consider that under the clearing house plan the traffic officials are not annoyed with complaints against the department handling the collections and there is less friction between the railroads and patrons for the reason that all are treated alike and must pay accordingly, you will then find it much easier to enforce the law and permit the retention of traffic for each line as may have been solicited, according to the service to be rendered. In other words, under this plan you can insist on the collection of transportation charges without driving the business away from any one line.

(The Address of F. L. Paetzold, Secretary and Treasurer of the Great Northern, on the Subject of the Use of Mechanical Devices in the Treasury Department Will Appear in Next Week's Railway Age.)

French Railway Begins Its Electrification Program

By A. H. Candee* and L. E. Lynde†

AFTER A CAREFUL investigation into the subject of electrification, the railroads of France have decided to electrify over 5,000 miles of their tracks. This decision will enable them to increase the capacity of their present trackage, and will at the same time utilize some of France's tremendous waterpower available in the Alps, Pyrenees and other mountainous sections. A large amount of the coal used by the railroads is imported, which not only is costly but proves a serious handicap in time of war.

The following lines have all made definite plans toward electrification; the Paris, Lyons & Mediterranean running to Marseilles-Nice-Monte Carlo and into Italy, as well as into the Alps where heavy grades were encountered; the Midi operating in the southern part of France; and the Paris-Orleans.

The Paris-Orleans is taking the initial step in electrifying approximately 145 route miles, including its main line extending from Paris to Vierzon. The trains of the Paris-Orleans leave Paris from Quai d'Orsay station, travel through one of the most densely populated sections of Paris, after which they head practically southwest for Orleans, a distance of about 75 miles. Enroute to Orleans the road passes through Bretigny from which point a short branch line to Dourdan will be electrified.

Orleans, a city of over 70,000 inhabitants located on the Loire river, is the terminal for a large number of lines. From Orleans the line runs by Nouan and Sabris in passing to Vierzon. Vierzon, which is approximately 125 miles from Paris, is the terminus of the steam locomotive division and it is this division which the Paris-Orleans is electrifying.

200 Locomotives Will Be Purchased

For operation over this zone and a future extension south of Vierzon, 200 locomotives will be purchased. The orders for the first 120 locomotives have already been placed with a group of French manufacturers, namely, Compagnie Electro Mecanique, Societe Schneider, Forges et Ateliers de Construc-

*Engineering Department, Westinghouse Electric & Manufacturing Company.

†Railway Department, Westinghouse Electric & Manufacturing Company.

tion Electriques de Jeumont and Compagnie Thompson Houston, each of whom will build a portion of the locomotives or equipment. Each locomotive will rate approximately 1,400 hp. for one hour and approximately 1,200 hp. continuously, both ratings being at 1,350 volts direct current. A single box cab will be mounted on two 0-4-0 swivel trucks, the total weight of locomotive complete being approximately 66 tons. The mechanical parts, however, will be of sufficient strength to permit of ballasting 79.35 tons, without any modification other than a change in springs. The dimensions of each locomotive are given in Table I.

TABLE I
Locomotive Dimensions

| | |
|--|---------------|
| Length between buffers | 41 ft. 5 in. |
| Length of cab | 36 ft. 3 in. |
| Width of cab | 9 ft. 10 in. |
| Total wheelbase | 28 ft. 11 in. |
| Rigid wheelbase | 8 ft. 10 in. |
| Distance between truck center pins | 10 ft. 0 in. |
| Diameter of new wheels | — 47½ in. |
| Thickness of steel tires | — 3 in. |

The specified tractive efforts for these locomotives are given in Table II, these being with a gear ratio of 21 to 62 and wheels of 1.20 meters diameter (47¼ inches). Each axle will be driven by a series type, 1,500-volt four-pole railway motor rated at 300 hp. continuously at 1,350 volts and 350 hp. for one hour at 1,350 volts.

TABLE II
Specified Continuous Tractive Efforts and Speeds

| Tractive Effort (lb.) | Speed (m.p.h.) | Tractive Efforts and Speeds |
|-----------------------|----------------|-----------------------------|
| 15,600 | 6.4 | Series connections |
| 12,200 | 8.6 | Series connections |
| 15,600 | 13.7 | Series-parallel connections |
| 12,200 | 28.8 | Series-parallel connections |
| 15,600 | 28.4 | Parallel connections |
| 12,200 | 36.8 | Parallel connections |
| | | Full field. |
| | | Min. field. |

While the mechanical parts and all but a few of the motors for these 120 locomotives are to be manufactured by European concerns, the complete control equipment will be built by the Westinghouse Electric & Manufacturing Company at its plant at East Pittsburgh, Pa. This is practically the only equipment which in its entirety will be manufactured for this electrification outside of Europe.

Locomotive Control Equipment

The locomotives are designed for double-end control, multiple unit operation and are governed through a low voltage battery train line. Westinghouse type HBF electro-pneumatic control will be used. The motors will be connected first in series, then in series-parallel and finally in parallel. Twelve series notches, nine series-parallel notches, and nine parallel points will be provided. The last two notches of each combination are field control notches, the field strength being reduced by means of inductive shunts. Variations in tractive effort from notch to notch must be kept very low on account of the limited strength of the car couplings. The circuits are arranged so that regenerative control and dynamic braking may be provided later with a minimum change by adding the necessary equipment in space left for that purpose. None of the locomotives will be provided with regenerative control at present, but extensions to the south of Vierzon will be over profiles which will warrant the use of this feature.

Third-Rail and Overhead Collectors Will Be Used

Power is to be received either through third-rail shoes or from overhead wire. It was the purpose at first to use a third-rail along the entire length of line except at stations, crossings, yards, and similar points, but the idea has been modified so that the use of the overhead conductor will be considerably extended.

The pantagraph trolleys will be of the air-raised gravity lowered type. A main knife switch will be provided for isolating the locomotive circuits from the trolleys and another will disconnect the circuits from the third-rail shoes.

The main circuit connections will be made by means of unit switches and cam switch groups, each being operated by compressed air at 70 lb. pressure per square inch. Use is made of cam switch groups only where it is found desirable to provide a mechanical interlocking of switches and where the cam shaft can be arranged for two positions only. Where cam groups must have three or more operating positions, the difficulty of stopping the cam shaft on an intermediate position would introduce a complication in the control and reduce its factor of reliability. Unit switches are also preferable for arc-braking service.

Overload protection is provided by the use of an overload relay for each individual motor circuit and also one for the main feeder circuit. A ribbon type fuse is placed in the circuit of each trolley and one fuse is placed on each side of the locomotive connected between the third-rail shoes on that side and the main knife switch. Provision will be made for installing a high speed line switch at a later date, should this be found necessary in order to further protect the motors against flashing.

One master controller will be placed in each end of the locomotive, to the left of the locomotive center line, with the brake valve to the left of the controller. The controller handle extends to the left of the controller for operation with the right hand. This arrangement is to conform to the standard French system of running on the left hand tracks.

Each locomotive will be provided with two blowers for motor ventilation and two compressors. The blowers will be arranged so that the failure of either will not cut off ventilating air from the motors. Expulsion type fuses will be used to protect these circuits. The control battery will be charged in series with the blower and compressor motors by the use of a battery-charging resistor and relay.

Rigid Acceptance Requirements for Locomotives

Very complete and thorough tests will be made of the various items of equipment both before installation in the locomotive and after the locomotive is complete. Preliminary acceptance of each of the first 10 locomotives will be given only after it has operated satisfactorily for a distance of 25,000 kilometers (15,500 miles). The balance of the locomotives will be given preliminary acceptance after operating satisfactorily for a distance of 1,865 miles. Each breakdown of more than four hours will extend the preliminary acceptance run by 621 miles for every two days or less that the locomotive is out of service due to defects. The preliminary acceptance for the first 10 locomotives, however, will be given within three months after their delivery if the necessary mileages have not been covered by that time. Subsequent locomotives will be given preliminary acceptance at the end of one month if the necessary distance has not been covered within that time.

Final acceptance of each locomotive will be given one year from the date of preliminary acceptance providing the locomotive has operated a distance of 31,000 miles. If the distance operated has been reduced on account of defective construction or design this final acceptance will be extended three months if the locomotive has operated more than 21,700 miles and six months if less than this distance. All dates, however, are based on very reasonable allowances, and afford the manufacturers every opportunity to fulfil their part of the contract with the minimum of hardship. It is expected that the first of these locomotives will be in operation by October 1, 1923, and that the order will be completed by January 1, 1925.

While this division extends over a fairly level country and no such tonnages are encountered as are handled in America, the fact that a complete steam division is to be electrified insures a direct comparison between the operation by steam and electricity and many interesting facts are expected to be obtained from this electrification.



Automatic Train Control From Four Viewpoints

Developments to Date—The Effect on the Mechanical, Signal and Transportation Departments

FOLLOWING ITS PRACTICE of setting aside one night each year for the consideration of automatic train control, the Western Society of Engineers, Chicago, presented a program on this subject on October 23, under the auspices of its Railroad Section. Four papers were presented, covering the development of automatic train control and installations made to date with a brief description of the systems at present in service or under test; train control as it affects the mechanical department; its relation to signaling, and the results to be expected from the transportation standpoint. W. J. Eck, signal and electrical superintendent of the Southern Railway, presented a paper on "Developments to Date and Installations." C. F. Giles, superintendent of machinery, Louisville and Nashville, talked on "Train Control from the Mechanical Standpoint." T. S. Stevens, signal engineer, Atchison, Topeka & Santa Fe, discussed "Train Control from the Signal Engineer's Standpoint," and A. W. Towsley, assistant to the vice-president and general manager, Chicago, Rock Island & Pacific, treated "Train Control from the Transportation Standpoint." Abstracts of three of these papers follow:

Development of Train Control

By W. J. Eck

Signal and Electrical Superintendent, Southern Railway

The desirability of some form of control of railway trains to bring a train to a stop safely in case of conditions endangering the train, independently of the driver, was recognized in the very beginning of railroading. No feasible method of accomplishing this result seemed possible, however, before the invention and general adoption of the power brake. The knowledge that the opening of the brake pipe line and the escape of the compressed air to the atmosphere, would cause an application of the brakes was recognized immediately as affording a means for stopping a train automatically independently of the action of the engineman. All train control devices have been based on this property of the air brake system.

A majority of the inventors who have worked upon this problem have considered that the opening of a valve in the brake pipe line was all that is necessary for a successful train control system. It involves much more than this, however, particularly in the case of heavy freight trains. Of the hundreds of schemes that have been proposed from time to time—(there are more than 5,000 patents on file in the United States Patent Office on the subject)—only about a

score have been considered worthy of service tests and development under actual railroad operating conditions. Many of the inventors had little or no knowledge of these conditions and their devices have little or no value; on the other hand many of the appliances have merit and a vast amount of intelligent and conscientious work has been done during the past 30 years.

The First Permanent Installation

The first permanent installation of automatic stops, so far as known, was made on the Boston Elevated Railway in 1899. It is still in use and consists of a controlled mechanical trip ground contact worked in conjunction with electro-pneumatic block signals. A similar installation was made on the Interborough Rapid Transit, New York, in 1903; also upon the Philadelphia Rapid Transit and the Hudson and Manhattan in 1908. This device consists of a lever arm operated by compressed air in conjunction with the signal system so that the arm is raised above the track when the block is obstructed. This arm engages the handle of a valve in the train pipe if a train should attempt to pass a signal indicating "Stop." The opening of this valve causes the brakes to be applied. A speed control feature devised by J. M. Waldron was added to the Interborough installation in 1912 which has materially increased the capacity of the road over that formerly existing with the plain automatic stop.

In 1910, the Washington Power Co. installed an automatic block signal system with automatic stops on 29 miles of a single-track electric interurban line. The device was similar to that originally used on the Pennsylvania, viz., a glass tube mounted upon the top of the cars and positioned so as to be broken by an arm attached to the block signal in case the signal is passed improperly when in the stop position. As there are no tunnels or overhead structures on this line its use here was not objectionable.

The Pennsylvania Railroad in 1911, in connection with the terminal improvements undertaken by it upon entering the city of New York, installed a system of automatic stops to protect trains using the tunnels under the Hudson river and throughout the electrified zone, extending to Manhattan Transfer, New Jersey. This automatic stop is of the mechanical trip type, electrically controlled. The valve in the brake pipe and the trip upon the ground are of special design and so arranged that ordinary obstructions along the track will not operate the air valve. Ballast, snow, frozen mud, etc., will sometimes operate a valve of the design used in subways and thus interfere with traffic. In this case the

ground grip is provided with a rotating member which raises the valve stem vertically when engaging and thus applying the brakes. It is shielded so that a horizontal blow will not affect the valve as is the case in the ordinary design.

The next installation of importance was one installed during the same year, 1911, by the Key route at Oakland, Calif. This is an electric line and the device protects 34 miles of double track, an important part of this mileage being upon a three-mile pier which extends out in the bay to the terminus of the ferryboats from San Francisco. The automatic stop consists of a mechanical trip overhead contact, in the shape of a metal arm attached to the signal. This arm is operated by a valve handle on top of the cars when the signal is disregarded. The tripping of this valve results in a service application of the brakes and it can only be restored to its normal position by the motorman's brake controller after the automatic brake application has become effective.

In 1912 the Brooklyn Rapid Transit made an extensive installation similar to that in the subway in New York and that on the Boston Elevated.

The next year, 1913, the Miller Train Control Company's intermittent electrical contact type automatic stop system was started on the Chicago & Eastern Illinois. This was not only the first permanent, but up to the present time it is the most extensive installation on a steam railway in the world. It is now in service on a double track division between Danville, Ill., and Dolton, a distance of 107 miles. There are 189 ramps, one of which is located braking distance from the signal governing the entrance to each block. These are controlled by the indication of the signal and the condition of the block in advance. Only one ramp is used per block without preliminary or caution indication.

The Chesapeake & Ohio Railway in 1916 and 1917 undertook the next permanent installation on a steam operated road in the United States by installing the American Train Control on 21 miles of single track between Charlottesville and Gordonsville, Va. An extension of this installation to Staunton, Va., a distance of 39 miles, is now being made and is practically ready for service at the present time.

In 1915 the American System was the subject of an experimental trial upon the Maryland & Pennsylvania Railway. It was then known as the Jones system and as such was tested by the Bureau of Safety of the I. C. C. The installation on the Chesapeake & Ohio, however, has been materially improved from the form originally tested and now consists of an intermittent electric contact system, the indications on the locomotive being picked up by the contact of shoes carried upon the locomotive, with rails located parallel with the main running rails. * * * The control circuits have been specially designed to meet local conditions and are a modification of those used in single-track automatic block signaling. The fixed signals along the roadway are of the light type: the day and the night indication both being given by colored lights.

The next installation in the United States in point of time was one made in 1918 by the United Railway & Electric Co., of Baltimore, Md. This is an electric road operating on the surface with two draw-bridges and 150 trolley cars protected with an overhead mechanical trip device. It consists of a valve with an extended arm mounted upon the top of the cars where it will be struck by an extension from the signal if the stop indication is disregarded.

The Chicago, Rock Island & Pacific, in 1919, started the installation of an automatic train control system, manufactured by the Regan Safety Devices Company, between Blue Island, Ill., and Joliet, a distance of 22 miles. The device is of the intermittent electrical contact type with speed control. Ramps are installed along the right-of-way in connection with the three-position upper-quadrant signals already protecting the tracks in this territory. These ramps are 120

ft. long and located 150 ft. in the rear of the signal. * * *

The system is designed to make an application of the brakes by the automatic control apparatus when any of the following conditions exist:

- (a) When a train passes a signal in the caution position at an excessive speed.
- (b) Whenever a train exceeds a predetermined speed while running in a caution block.
- (c) At a stop signal, or when a block is occupied.

Work of Joint Committee on Train Control

The Interstate Commerce Act of 1920 empowered the Interstate Commerce Commission to order the installation of automatic train stops or train control that would comply with the commission's specifications and requirements upon the lines of any carriers subject to the Act. To assist in carrying out the provisions of this act and the request of the commission a joint committee representing the various sections and divisions of the American Railway Association was appointed and started work in September, 1920. Specifications and requirements of automatic stops and train control were formulated, all existing installations investigated, and arrangements made with the New York Central and the Southern Pacific for the installation of types of train control for test purposes that have not heretofore been fully tried out under service conditions.

Upon the Southern Pacific, the National Safety Appliance Co. has installed a system of intermittent inductive train control between Haywood, Calif., and Halveen, a distance of 4½ miles. This system was tested by the Interstate Commerce Commission on the Western Pacific at Oroville, Calif., in 1919. Material improvements have been made recently and the system is now under observation by representatives of the joint committee.

A permanent magnet of laminated steel, located between the rails, is installed at each indication point. This is neutralized by a suitable coil energized by a roadside battery when the block is unobstructed. The locomotive apparatus consists of magnetic valves mounted under the tender in such a position as to come within the field of the track magnets. An air valve controlling the brake application is connected to the magnetic valve by suitable piping. No electric energy is required on the engine.

On the New York Central tests are to be made upon the apparatus of the Sprague Safety Control and Signal Corporation. The installation consists of equipment on one locomotive and about six miles of track in a very busy electrically operated section near New York City. The system is of the intermittent non-contact induction type, with speed control, cab signals and a recording device. Electrical energy from storage batteries is used for neutralizing the normal danger track magnets when the block is clear. This is controlled by the relays of the wayside signal system so that the track magnets are not neutralized when the block is obstructed and by their influence upon the engine receiver cause the display of the proper signal in the cab and the application of the brakes. * * * The installation has been under observation for some months by the joint committee and official tests will probably be started within the next few days.

Order No. 13413

The Interstate Commerce Commission issued its now famous order No. 13413 on June 13, 1922, requiring automatic train stop or train control devices upon 49 carriers in the United States. Installations on one passenger locomotive division on each of the lines to be completed by January 1, 1925. Largely on account of the strike of the railway shopmen, starting of this work has been delayed so that few have been able to announce the type and character of the device to be used in compliance with the order. The matter is being actively handled at the present time and it is expected

that work will be started at an early date on all of the lines specified.

The Pennsylvania and the Chicago & North Western have already announced that they will make experimental installations of a practical nature to determine the characteristics of the system selected by them and its performance under the various operating conditions met in railroad service previous to its installation on the very large scale required by the Interstate Commerce Commission.

The Pennsylvania has under construction at the present time the automatic train control system developed by the Union Switch & Signal Co., and the Westinghouse Air Brake Co. The test installation will extend from about one mile from Lewiston, Pa., over a single-track line for 45 miles to Selinsgrove junction, thence over a double-track line to Sunbury, Pa., the latter portion being now equipped with a. c. track circuits and automatic position light signals.

Wayside signals will be installed where none are now in service, approximately one-half of which will be controlled by the train dispatcher at Sunbury and the other half of

at the caution signal if the engineman acknowledges the signal by operating a lever, thus indicating that he has seen and understands the indication of the signal and will properly control his train. The acknowledgment valve cannot be tied down to permanently cut out the device. * * *

The systems that have been described include only the most prominent of those that have been installed on an extensive scale for regular service. In addition, there have been many experimental trials of various devices made upon railroads of the United States during the past 34 years. For the record, I have compiled a list of some 35 of those that have come to my personal attention. It is no doubt incomplete. Some of the devices are no longer being advocated, while the proprietors of others are quite active in their development. Much, however, still remains to be done, for there are yet many unsolved problems in the art of automatic train control.

Automatic Train Control

from a Mechanical Standpoint

By C. F. Giles

Superintendent Machinery, Louisville & Nashville

AUTOMATIC STOP AND TRAIN CONTROL SYSTEMS TESTED ON AMERICAN RAILROADS

| Name | Type | Where Tested | Year |
|-----------------------|-------------------------|---------------------------|------|
| Buell | Insulated truck | Southern Ry. | 1906 |
| Bulla | Ramp | E. P. & S. W. Ry. | 1919 |
| Clark | Inductive | Pere Marquette | 1921 |
| Clifford | Auxiliary Track Circuit | Erie | 1922 |
| Fox (A. H.) | Inductive | New York Central | 1911 |
| Finnigan (G. P.) | Inductive | I. R. T. Co. | 1911 |
| Gen. Safety Appl. Co. | Ramp | Spokane Inland R.R. | 1919 |
| Gray-Thurber | Insulated truck | Penna. Lines | 1911 |
| Gollos | Ramp contact | C. G. W. Ry. | 1912 |
| General | Ramp contact | B. R. T. | 1912 |
| Harrington | Overhead trip | Erie | 1908 |
| Induction Sig. Co. | Inductive | New York Central | 1913 |
| International | Mechanical trip | D. L. & W. | 1912 |
| Julian Beggs | Ramp contact | C. N. O. & T. B. | 1916 |
| Jones (D. C.) | Ramp contact | Southern Ry. | 1910 |
| Jones | Ramp contact | Maryland & Pa. | 1913 |
| Lacroix | Ramp contact | Staten Is. R. T. | 1911 |
| M. V. All Weather | Inductive | Raritan R. R. | 1922 |
| Nevins-Wallace | Mechanical trip | B. & M. R. R. | 1919 |
| Orcutt | Ramp type contact | B. & A. R. R. | 1919 |
| Otis | Ramp | Canadian Pacific | 1920 |
| Patterson (H. D.) | Inductive | New York Central | 1909 |
| Prentice's | Wireless | Canadian Pacific | 1911 |
| Ry. Auto Safety | | | |
| Appl. Co. | Mechanical trip | Pere Marquette | 1911 |
| Safety | Ramp contact | Hunt's'n & B. R. M. R. R. | 1912 |
| Sanor & Conkell | Third Rail | W. & L. E. R. R. | 1913 |
| Shadle | Ramp contact | C. I. & W. | 1919 |
| Simmen | Ramp | A. T. & S. F. | 1908 |
| Simplex | Insulated engine wheels | B. R. & P. R. R. | 1921 |
| Schweyer | Inductive | P. & R. Ry. | 1918 |
| Sindebrand-Woticky | Track circuit | N. Y. C. & H. R. R. | 1913 |
| Steigelmeyer | Ramp | Big Four | 1909 |
| Union | Ramp contact | D. L. & W. | 1913 |
| Warthen (H. J.) | Overhead trolley | B. R. & P. | 1911 |
| Webb | Ramp contact | Erie | 1922 |
| Wooding | Ramp contact | D. L. & W. R. R. | 1916 |

the single-track line will be operated by a modified absolute permissive block system controlled by trains. This system is unique in that it provides continuous control, all other installations of any material size being of the intermittent type. * * * Continuous control system, such as this, provide full speed control and transmit the indication to the cab of the locomotive at all times, thus giving immediate indication of any change in conditions in the same block or the block ahead.

The Chicago & North Western has announced that a contract has been signed with the General Railway Signal Company for an extensive test of its intermittent inductive train control with inert roadside elements. This system requires no energy on the roadway or physical contact between engine and roadway parts. The roadside element consists of a "U"-shaped laminated iron core with a coil winding which may be opened and closed by the contacts on a relay in the signal-system. The engine equipment includes a pair of coils mounted so as to pass directly over the track element, a storage battery, relays, an electro-pneumatic valve and means for applying a service application of the brakes through the engineman's regular brake valve. * * * It can be arranged, if desired, so that the application will not take place

Aside from the expense of the initial application of an automatic train control device to a locomotive, proper and adequate maintenance will undoubtedly prove the most vital and perhaps the most difficult factor to contend with from a mechanical standpoint. The modern locomotive, representing such a large capital investment, must necessarily be handled and placed in serviceable condition at terminals with all possible dispatch so as to minimize the unproductive period of time during which this investment remains idle. It goes without saying that every additional device applied to a locomotive requires a certain amount of care and attention, more or less proportionate to the intricacy of the mechanism, the intensity of use or the importance of its function. Additional devices tend to retard the prompt completion of the work of inspection and repairs to locomotives at terminals. Therefore, unless such devices effect economies at least commensurate with the time and labor expended for their proper maintenance, they will prove to be a burden and a distinct loss from a financial standpoint.

The only device on a locomotive today to which the maintenance and inspection of the automatic train control may be considered as being comparable is the automatic air brake equipment. In this connection, educational plans and the organization of forces have proved necessary to insure the successful maintenance and operation of the automatic air brake. The methods used for instructing and training the employees must also be carried on regularly and constantly to effect satisfactory results in the operation of the air brake equipment by the engineman, upon whom evolves the making of emergency repairs on the line with the least possible delay, and to insure proper inspection and repairs to the apparatus on the part of the shop and engine house mechanics specially assigned to this work.

It appears only reasonable to predict that somewhat similar methods, more or less extensive in their scope, will have to be inaugurated to care for the inspection and maintenance of the automatic train control apparatus successfully when applied to locomotives. However, the insurance of the successful operation of the latter device will quite probably prove more difficult of attainment than the air brake, for the reason that no occasion may arise for the automatic train control to function during one or many complete trips, and consequently no reports from the enginemen concerning its operative condition can be anticipated; whereas, the condition of the air brake equipment, which is regularly operated on every trip, can and must be reported on intelligently by enginemen after arrival at terminals.

Thus, in the case of a locomotive equipped with an automatic train control device, it is quite apparent that a com-

plete and extensive test of the latter must necessarily be conducted on arrival at, and before departure from, each terminal to determine whether it will perform the important automatic function that may be required of it on the following trip satisfactorily and unfailingly, and to locate and repair any defects that may exist in the equipment. The extent of the maintenance required will, in a measure, depend on the nature of the particular installation, the number of locomotives equipped, the type of device selected and the extent of train control that is desired. Nevertheless, it is obvious that additional forces of expert employees will have to be assigned to maintain this important and intricate mechanism properly, in addition to keeping accurate and infallible records of its conditions so that such records may be produced whenever required for any cause. The additional work of repairs and inspection demanded of this equipment will tend materially to increase the time required for the completion of repairs to locomotives held at engine terminals for that purpose.

Train Control from the Operating Standpoint

By A. W. Towsley

Assistant to Vice-president and General Manager, Chicago, Rock Island & Pacific

The advantages and disadvantages of train control are evident only after an opportunity has been afforded one to study the various devices under test. In my opinion the advantages are: (1) safety, (2) the elimination of long interruptions to traffic, (3) increased productiveness of track, or ability to run an increased number of trains with minimum interruption. If an engineman does not perform this work, this apparatus will perform it for him without taking away from him the initiative for the proper performance of his functions.

Among the disadvantages is the possibility of tying up power at terminals because of interruptions or reported failures of the mechanism to operate. This may result from the engineman neglecting to report the failure of the apparatus because there is no check on its operation. It has been estimated that we are only getting productive service out of freight locomotives 43 per cent of the time. Any measure that will increase the amount of this unproductive time is a disadvantage. The advantages of train control outweigh the disadvantages.

(The Paper on Automatic Train Control from a Signal Engineer's Viewpoint, Presented by Thomas A. Stevens, Signal Engineer of the Atchison, Topeka & Santa Fe, and the Discussion on All the Papers Will Appear in Next Week's Issue of the Railway Age.)

SENATOR G. W. PEPPER, of Pennsylvania, speaking before members of the Philadelphia Chamber of Commerce recently discussed the efficacy of public opinion as a means for solving the problems that hinder industrial peace. "It may well be worth while to provide adequate machinery for making an appeal to the jury of American public opinion. It might be a fine thing in a particular industry or in groups of industries to provide for impaneling the American public. A governmental organization which in an emergency can function by calling into existence a jury or commission composed of those whom the public will trust, may both enlighten the public as to the merits of the controversy and focus public opinion in such a way that the parties to the dispute cannot withstand it. . . . But if our hearts are not right, all we can hope to do is to make the best of a bad situation. If employers and unions not only lack confidence in one another, but if the lack of confidence is deserved and if the stabilizing of industry does not itself minimize the labor problem, then we must inevitably flounder. Let us set up sufficient governmental organization to give us official forecasters who will scan the skies and sense the air currents. Let them be empowered to invoke executive action for the impaneling of emergency juries. . . ."

Interstate Commerce Commission Issues First Final Valuation

WASHINGTON, D. C.

THE INTERSTATE Commerce Commission on October 21 made public its first order establishing a final value of a railroad in accordance with the valuation act, in the case of the Evansville & Indianapolis Railroad Company as of June 30, 1915. The case, however, which is Valuation Docket No. 51, was decided on July 11. The valuation in this case was made final by default because, although the receiver filed a protest against the tentative valuation, the railroad was later acquired by the Evansville, Indianapolis & Terre Haute, the stock of which was purchased in June, 1921, by the Cleveland, Cincinnati, Chicago & St. Louis, and neither company offered any evidence in support of the protest which had been filed. The commission, therefore, finds and declares that the tentative valuation contained in its order of October 18, 1919, as modified by the supplemental tentative valuation as contained in its order of June 11, 1921, has become and is the final valuation of the property. The tentative valuation and supplemental tentative valuation, as modified because of the repeal of the clause in the valuation act which requires a finding of the present cost of condemnation and damages or of purchase of lands in excess of original cost or present value, have been combined and are set out in the order embodying the final valuation. The final value of the property owned is given as \$2,250,000 and that of the property used as \$2,250,291.

Commissioners Eastman, Potter and Cox dissented from the finding of the commission and Commissioner Daniels concurred only in part. He said he made no question of the propriety of the figure reached as the final value as the company has not seen fit effectively to prosecute a protest, but that the method of reaching the valuation in this case seems to be in disregard of the express mandate of the statute. He was of the opinion that the report is defective in failing to follow the express mandate of the statute requiring the ascertainment and report separately of other values and elements of value and an analysis of the methods of valuation employed and of the reasons. He stated that his reasons for non-concurrence in certain of the methods of valuation employed had been set out more at length in the Kansas City Southern case and for those reasons he takes similar exceptions to this report.

Commissioner Eastman in his dissenting opinion, in which Commissioners Potter and Cox concurred, said:

"This is the first case in which the commission has fixed the so-called final value of the property of any carrier. The report does not indicate in any way the method or process by which that value was determined, and yet this is the thing of crucial importance in our valuation work. Fundamental questions of law and public policy are involved, many of which have been argued before us in contested cases, no one of which has yet been decided. So far as I know, these questions have not been determined by the commission. Until they are determined and the reasons for the conclusions reached have been made known I believe that we ought not to attempt to fix the 'final value' of any property. The fact that in this case no protests are now outstanding is not conclusive that the value stated is the correct value."

THE COMMITTEE ON FREIGHT CLAIM PREVENTION of the American Railway Association will issue a series of prevention suggestions entitled, "Thoughts," for various classes of employees. It is not expected that these thoughts will fit all conditions. They are gathered from various sources and some applying in one instance will not apply in another, but all will serve the purpose indicated in the title as providing thoughts for those particular employees.

The du Pont-Simplex Type Locomotive Stoker

Simplicity and Ruggedness Are Features of New Design
Brought Out by Standard Stoker Company

A NEW DESIGN of locomotive stoker, known as the du Pont-Simplex type, has recently been developed by the Standard Stoker Company, New York. The principal features of the machine are clearly shown in the assembled view, Fig. 1. When applied to the locomotive the tender trough, shown at the right, is built into the floor of the tender. The engine is located under the cab deck and the vertical conveyor and housing, shown at the extreme left, are placed against the inside rear wall of the firebox, the housing being just above the level of the grate.

The operation of the stoker is briefly as follows: Coal from the tender drops into the trough below the tender deck by gravity and is moved forward by a screw conveyor which carries the coal through a crusher and into a covered trough extending forward under the engine deck and mud ring. At

tender is made in two parts, one of which slides inside the other. The entire construction is such that the tender may be backed away from the locomotive without disconnecting any portion, or removing any bolts. A section of the locomotive trough is open at the top and provided with a slotted cover through which the movement of the coal may be seen.

The vertical, cylindrical housing into which the coal is discharged from the horizontal conveyor has a vertical screw which makes two revolutions to one revolution of the horizontal screw. This avoids any possibility of choking when the coal changes its direction of movement. The weight of the locomotive trough and the vertical housing is carried directly on the locomotive frame.

To adapt the vertical housing to various designs of locomotives, it is made in two parts, the lower half of standard

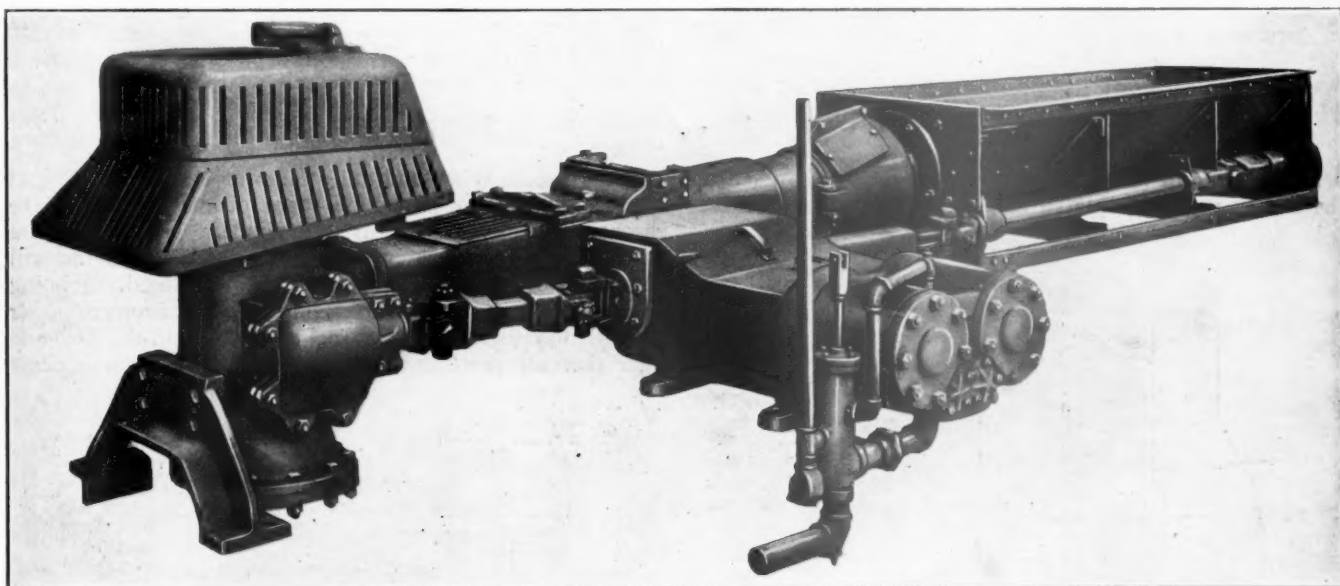


Fig. 1—Assembled View of du Pont-Simplex Stoker

the front of this trough the coal is delivered into a housing containing a vertical lifting screw, which raises the coal until it overflows onto a horizontal surface, from which it is distributed to the various portions of the grate by continuous steam jets manually controlled. The amount of coal fired is determined by manual control of the speed of the driving engine and its distribution to various parts of the firebox is effected by manipulation of the valves controlling the steam supply to the jets.

The construction of the stoker has been carefully worked out to insure continuous operation with the minimum of maintenance. The tender trough is of steel plates and angles and is so secured that it may be removed when the engine and tender are separated. A cast-steel gear casing at the rear of this trough drives the entire horizontal conveyor screw which delivers the coal into the vertical housing. The coal drops from the tender into the tender trough through a longitudinal slot in the deck. Sliding plates permit closing off the coal entirely from the trough, or allow admission to any section desired. The crusher consists of a heavy steel casting with rearwardly projecting spikes at the front of the tender trough, against which oversize lumps of coal are broken. The portion of the conveying system between the locomotive and

construction, and the upper of variable length to suit the grate of the locomotive to which it is applied. The lower section contains the gears which transfer the motion of the driving engine shaft to the vertical screw. The construction is such that it is impossible for any of the coal dust to work into the gear housings. Even if moisture is carried over with coal, the water can drain from the trough before it can gain access to the gear casing. The gears are all steel with cut teeth and run flooded in oil.

The upper portion of the vertical housing extends above the level of the grates, and would be subject to overheating if provision were not made to protect it. For this reason the vertical section of the housing is enclosed in a cast-iron protecting grate with an air space between. This protecting grate is provided with slots through which air is drawn from the ash pan by the stack draft when the locomotive is running. This air serves a dual purpose, preventing overheating of the protecting grates, and supplying above the fuel bed an amount of air sufficient to furnish the oxygen necessary for the combustion of the volatiles from the coal.

The coal as it rises to the top of the vertical housing overflows on the upper surface of the protecting grate. From this surface it is blown into the firebox and down upon the

surface of the fire by steam jets. These steam jets are divided into five groups, each group being controlled by a separate valve, and by manipulation of these valves varying amounts of coal may be discharged to different portions of the grate

of coal discharged by the stoker is controlled by varying the speed of the engine. During normal operation and when normal run of mine coal is being fed, this engine runs along with very low cylinder pressure, the throttle valve being only

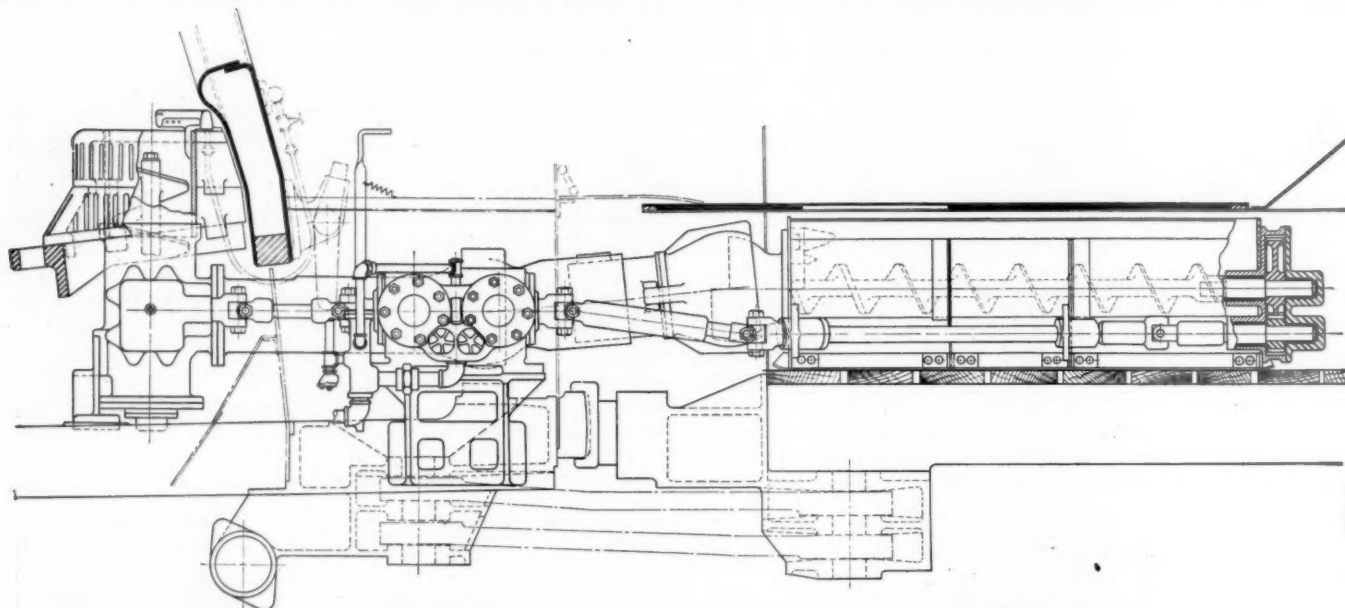


Fig. 2—Side Elevation Drawing Showing Arrangement of Parts on the Locomotive

so as to maintain an even and uniform depth of fuel bed. The control valves are placed in a convenient position on the

slightly open. If an unusually large or hard lump of coal reaches the crusher plate, the speed of the engine will be checked and the pressure in the cylinders will rapidly rise until the obstruction is crushed, after which the engine will make one or two revolutions at increased speed, dropping back at once to its normal rate. The amount of reserve power is ample to crush the hardest fuel employed and the design is such that all parts have sufficient strength to permit the

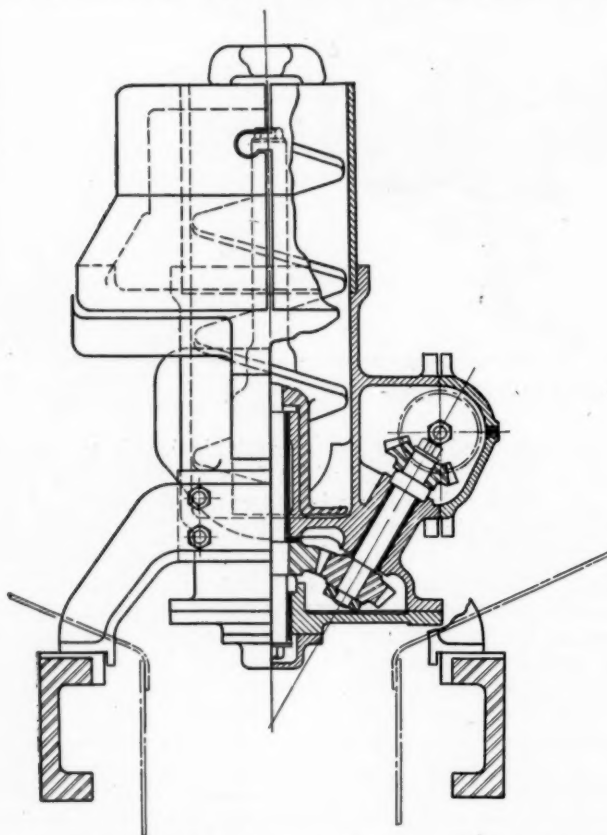


Fig. 3—The Vertical Housing Is Carefully Designed to Prevent Coal Dust or Water from Reaching the Bearings

boiler front where they may be readily reached by the fireman.

The driving of the stoker is effected by means of a two-cylinder, double-acting, slow-moving engine and the amount

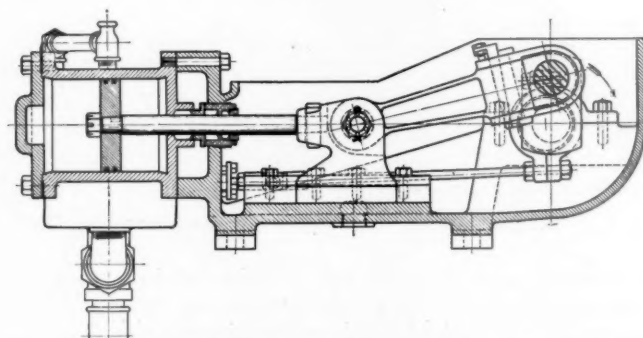


Fig. 4—Section Through Engine, Showing Simplicity of Construction

engine to be abruptly stopped when running at delivery speed without anything giving away.

The design of the engine as will be noted from the illustrations, is extremely simple and rugged. The crank shaft, connecting rods, cross-heads and valve gear are all enclosed in a box casting, the cover of which is made of sheet metal for easy removal to provide accessibility. With the exception of the cylinders, all working parts are lubricated by splash lubrication. The box and the cover are of such a design as to avoid loss of oil and to prevent admission of dust to the enclosed box itself.

The valves of the engine are of the piston type, each driven by a single eccentric. It is necessary in any stoker to be able to reverse the driving engine to loosen a jam, and to effect this a simple outside valve is provided which interchanges the functions between the inlet and exhaust passages.

At each end of the crank shaft of the driving engine is a universal joint, which on the rear side connects to the driving shaft for the horizontal conveying system. A slip joint is provided to allow for the movement between the tender and the locomotive which occurs when rounding curves.

The universal coupling on the forward end of the driving engine crank shaft is connected through universal couplings to a short section of a shaft on the end of which is the first gear of the enclosed train which drives the vertical screw. The details of this drive are clearly indicated in the illustration and have been referred to above.

One of the special features of the stoker is that the coal is

delivered into the firebox at a relatively low level. This method of delivery, together with the downwardly directing force of the steam jets, it is stated, avoids fuel losses due to the fine particles being swept above the arch by the action of the draft before being consumed. The continuous introduction of the fuel is also claimed to be a decided advantage.

Extreme care has been used in the design of this stoker to avoid all elements of weakness which have appeared in past practice. The flexibility of the arrangement provided by the universal couplings and slip joints makes it relatively easy to apply the standard design to the many varying types of locomotives.

New Officers for International—Great Northern

J. W. Kendrick and T. A. Hamilton to Take Charge as Chairman of Board and President on December 1

BY ACTION of J. & W. Seligman & Co. and Speyer & Co., in charge of the reorganization of the International & Great Northern, J. W. Kendrick, private consultant in matters pertaining to railroad construction, operation and maintenance, Chicago, has been selected as chairman of the board, and T. A. Hamilton, vice-president in charge of operation and assistant to the president of the St. Louis-San Francisco, president of the reorganized company. These

of the International Railway and the Houston & Great Northern. To aid the company in completing the road, the bondholders funded a portion of their coupons—four on the first mortgage and eight on the others—into 7 per cent gold bonds, preferred, and ranking ahead of the original bonds. In April, 1878, upon the suit of the second mortgage bondholders, the road was placed in the hands of a receiver and was sold to a committee of the bondholders, by whom it was



T. A. Hamilton



J. W. Kendrick

officers will assume charge of the property on the termination of the receivership on December 1.

This step brings to an end another chapter in the checkered history of this road of 1,160 miles, all of which is located within the state of Texas. Its principal lines extend from Longview to Galveston and to Laredo and from Galveston to Fort Worth.

The International-Great Northern was chartered on September 27, 1873, under the laws of Texas as a consolidation

reorganized. By the terms of the reorganization, holders of the old H. & G. N. bonds received \$1,278.95, and holders of old International bonds, \$1,294 for each \$1,000 bond, which amounts were paid, one-half in new first mortgage 6 per cent bonds, and one-half in new second mortgage 8 per cent income bonds.

On May 1, 1888, default was made in payment of the interest on the first mortgage bonds and this was followed by default in the payment of the second mortgage interest.

The road was placed in the hands of receivers on February 21, 1889, and in 1892 was reorganized without foreclosure. Under the new plan one-half of the total amount of the defaulted coupons of the first mortgage bonds with interest was paid in cash and the remaining half was deposited with the Central Trust Company, which issued its trust receipts that bore interest at the rate of 5 per cent per annum, payable semi-annually beginning November 1, 1892, and were to be payable in 6 yearly installments. Of the amount of defaulted coupons of the second mortgage, half the coupon interest was paid in cash and the remainder exchanged at their face value for new third mortgage bonds.

The new organization continued until February 26, 1908, when a receiver was appointed upon default in payment of the coupons of the third mortgage bonds and the road was sold under foreclosure on June 13, 1911, to a representative of the third mortgage bondholders, who undertook its reorganization. On August 11, 1914, a receiver was appointed at the instance of the noteholders protective committee as it was impossible to meet either the interest or principal of the notes and in June, 1922, the company was reorganized.

Under the new plan, as outlined in the *Railway Age* of June 3, 1922, page 1312, the International-Great Northern will reduce its fixed charges from \$1,597,175 to \$1,179,000 and will have a working fund of approximately \$4,000,000 that will enable the company to make the necessary improvements outlined in the *Railway Age* of June 10, page 1347, and continue those interrupted by lack of funds.

In recommendations which were included with the reorganization plans, J. W. Kendrick estimated that the property should be able to have a net income available for interest and dividends of \$3,031,512 in 1923 and that the operating ratio should not exceed 76. Indicative of the breadth of the measures which are contemplated, special attention will be given to the elimination of the boll weevil and malaria fever which, if successful, will add greatly to the traffic of the road and increase the efficiency of employees respectively.

J. W. Kendrick

In becoming chairman of the board of directors of this property, Mr. Kendrick will bring to it a detailed knowledge of its present condition and its possibilities, based upon his thorough studies of this property during the last five years and supplemented by nearly half a century of active experience in the construction and rebuilding of important western railways. He was born on October 14, 1853, at Worcester, Mass., and graduated from Worcester Polytechnic Institute in 1873. In 1878 he entered railway service as a levelman on a construction party on the Yellowstone division of the Northern Pacific and was engaged in the location of the Yellowstone and Missouri divisions of that road until 1880. In the latter year he was promoted to engineer in charge of constructing the above divisions, 160 miles of line, and remained in this capacity until 1883, when he became chief engineer of the St. Paul & Northern Pacific (Northern Pacific) in charge of the construction of a line connecting Staples, Minn., Brainerd, Minneapolis and St. Paul, with the necessary terminals and shops. At the end of five years he became chief engineer of the Northern Pacific and its leased lines, and in July, 1893, was made general manager for the receivers of the Northern Pacific and later of the reorganized company. His success during the 6 years as general manager is shown by his promotion on February 1, 1899, to vice-president in charge of operation, which position he held until June 5, 1901, when he became vice-president in charge of operation of the Atchison, Topeka & Santa Fe and remained in that capacity until June, 1911, when he established a private practice in Chicago as consultant in matters of railroad construction, operation and maintenance.

During the 11 years in which he has been engaged in private practice, he has made over 50 investigations, large

and small, in connection with railroad construction and reorganizations and for the purpose of determining the basis for improvements in operation. Among the more important of these are operating reports on the Wabash and the Chicago & Eastern Illinois; a valuation report on the Canadian Pacific line between Windsor and Montreal in 1912; an operating and financial report on the St. Louis-San Francisco in 1913; a grade reduction study of the Erie and an operating report on the Pere Marquette in 1914; operating reports on the Chicago, Rock Island & Pacific and Minneapolis & St. Louis in 1915; an investigation of accounting methods and proposed changes for the Missouri, Kansas & Texas in 1916; an operating report on the International & Great Northern in 1917; an investigation of traffic tributary to proposed feeder lines and estimates of cost of such lines for the Western Pacific in 1917 and 1918; a valuation of rolling equipment and shops of the Pullman Company in 1919; a report on the cost of construction and operation of a proposed line of the Itabira Railway in Brazil in 1920, 1921 and 1922; and an operating report on the International Railways of Central America in 1921.

T. A. Hamilton

Mr. Kendrick will be ably assisted by T. A. Hamilton, who as vice-president in charge of operation and assistant to the president of the St. Louis-San Francisco, has had an important part in carrying out the plans outlined by Mr. Kendrick for the rehabilitation of that property. Mr. Hamilton is another example of the large number of railway officers who have worked their way up through the ranks to executive positions. He was born on January 21, 1874, at St. Louis, Mo., and was educated in the public schools of Toronto, Ont. In 1887, he entered railway service as a messenger boy in the superintendent's office of the Canadian Pacific and at the end of two years became a clerk in the assistant general manager's office of the Chicago & Grand Trunk (Grand Trunk) at Detroit, Mich., which position he held until 1890, when he was transferred to the general freight agent's office at Chicago. He left the service of the Chicago & Grand Trunk in 1892 to become a car accountant in the local freight office of the Missouri Pacific at St. Louis, Mo., and in the following year he obtained a similar position with the Galveston, Harrisburg & San Antonio (Southern Pacific) at Houston, Tex. In 1894 he returned to the Missouri Pacific as an assistant in the general auditor's office at St. Louis, Mo., in charge of agents' accounts, reconsignments and overcharge claims, and two years later he entered the service of the Illinois Central, where he remained until 1899, holding the positions of rate clerk, chief bill clerk and chief yard clerk at East St. Louis, Ill. On the latter date he again returned to the Missouri Pacific as chief clerk to the superintendent of De Soto, Mo., and from 1901 to 1907 was employed by the Louisville & Nashville, where he was successively chief bill clerk, chief yard clerk, chief clerk to the terminal superintendent and chief clerk in the traffic department.

For the next four years his former experience was utilized and extended by his association with Haskins & Sells, certified public accountants, New York, where he was engaged in railroad cost studies, examinations and miscellaneous accounting work. The period from 1911 to December 1, 1922, was devoted to the St. Louis & San Francisco and its successor, the St. Louis-San Francisco. During the first four years he was a special assistant to the vice-president of operation, part of the time holding the title of supervisor of efficiency and working in all branches of the operating department, and for the next year and one half he was in charge of the reorganization of the accounting department. While the road was under federal control he was vice-president of the corporation, and on March 1, 1920, he was made vice-president of operation and assistant to the president.

General News Department

The Interstate Commerce Commission has set for hearing on November 21, at Washington, the petition of the Southern Pacific for authority to retain the Central Pacific.

Position-light signals, in use extensively on the Pennsylvania Railroad, have been made standard on the Lehigh Valley. Considerable numbers of them have been installed, at various points, in place of semaphores which needed renewal.

Near Williamsport, Ind., on October 19, Wabash eastbound passenger train No. 2 was derailed, resulting in the death of the engineman, an express messenger and a baggageman. Belief has been expressed that spikes were purposely loosened, permitting the rail to spread and derail the train.

The Eastern Railroad Association announces that James T. Wallis, chief of motive power of the Pennsylvania, has been elected president of the Association, in the place of A. W. Gibbs, deceased. John M. Henry, Long Island Railroad, has been elected a member of the executive committee. The office of the Association is at 614 F Street, Washington, D. C.

Friday, October 13, was the 20th anniversary of the first operation of the radio telegraph, using Hertzian waves, from a station to a moving railroad train. It was on the Grand Trunk, between St. Dominique, Que., 30 miles west of Montreal, and a special train carrying members of the general passenger agents' association on the way to their annual meeting at Portland, Me.

The Northern Pacific has asked the Interstate Commerce Commission to modify its automatic train control order so that it may make the required installation on that part of its main line from Mandan to Dickinson, N. D., comprising a full passenger locomotive division of 109.6 miles, instead of between St. Paul and Mandan. The application states that this line has recently been equipped with a thoroughly modern automatic block signal system that would lend itself to the changes.

T. P. Healey, examiner of the Interstate Commerce Commission, last week resumed hearings in the southern states on the tentative plans of the Commission for the consolidation of railroads, as called for by the Transportation Act of 1920. Hearings were conducted in Mobile, Ala., and Jacksonville, Fla., early in the week, and on Thursday there was a hearing at Atlanta. Representatives of numerous small roads gave their views as to how the different companies ought to be combined.

Illinois Central Roundhouse at Council

Bluffs Partially Destroyed by Fire

Fire broke out in the roundhouse of the Illinois Central at Council Bluffs, Ia., on October 16, presumably due to defective electric light wiring which ignited the roof of the building and destroyed all of the wooden parts of the structure. Eight engines were in the building at the time of the fire. The total damage to the engines and the roundhouse is estimated at \$21,000.

A Love-Feast

The shopmen of the Central of Georgia at Macon, Ga., several hundred of them, on October 18 entertained the Rotary Club of Macon, and other friends, at luncheon in the mammoth machine shop; 92 Rotarians and 60 other guests. The tables were decorated with chrysanthemums and the colors of the Rotary Club. A number of officers of the railroad were present, and one of them, John D. McCartney, assistant to the president, acted as spokesman for the hosts. Following the luncheon, the visitors inspected the shops. This luncheon appears to have been given

in recognition of the friendly relations existing between the railroad and the people of the city during the recent disturbances due to the strike.

A. R. A. Convention Postponed

The American Railway Association, through a notice issued by R. H. Aishton, president, announces that in view of the present situation in the railroad world the Board of Directors has decided to postpone the annual session of the Association. Announcement will be made later of a date which will be selected for a session.

Train Control Order Changed

The Interstate Commerce Commission, by an order issued on October 14, in lieu of the requirement in its previous order, has authorized the Southern Pacific to install automatic train control between Oakland, Cal., and Tracy; has authorized the Philadelphia & Reading to install between Camden, N. J., and Atlantic City; and the St. Louis-San Francisco to install between Springfield, Mo., and Sapulpa, Okla. In all other respects, the order of June 13 is to remain in full force and effect.

A. R. A. Asked to Repeat Careful Crossing Campaign

The executive committee of the Steam Railroad Section, of the National Safety Council, at a meeting at Washington last week, unanimously recommended that the American Railway Association be urged to repeat during the summer of 1923 the Careful Crossing Campaign which it conducted this year. Statistics to show the result of the campaign are now being compiled and will be announced as soon as completed. L. G. Bentley (C. & O.) Richmond, Va., is chairman of the Steam Railroad Section.

O. H. & E. Abandoned

The Oberlin, Hampton & Eastern, a railroad extending from Oberlin, La., to Hampton, 10 miles, has been given permission by the Louisiana Public Service Commission to discontinue operations and to dispose of its tracks and equipment. It appears that this line, like many others in that section of Louisiana, was constructed primarily for the transportation of forest products, and its operations as a general carrier have been but incidental. The log and lumber tonnage has disappeared; the mills have discontinued operations and there is now no freight to be handled. Heavy deficits have been incurred for the past several years and with the completion of a gravel highway paralleling the applicant's line these deficits will be increased.

Traffic Records on the Central of Georgia

The Central of Georgia in the month of September established four new efficiency records: (1) Moved the greatest number of tons of freight in its history; (2) Moved freight cars an average of 34.19 miles per car per day; (3) 613 net ton miles per car per day; (4) Per cent of loaded car miles to total car miles, 78.

This is the salient point in one of the railway company's usual advertisements printed in daily and weekly papers throughout the company's territory during the past week or two. The advertisement, signed by President W. A. Winburn, contains a hearty tribute to the loyal and energetic efforts of the officers and men who carried on this traffic. Other statements in the advertisement (to substantiate the road's recent declaration that it had overcome the shopmen's strike) tell of increased efficiency in maintaining train schedules and in keeping cars and locomotives in good repair. During the month, the company had in use only about 7,000 freight cars, which is but 81 per cent of the number of cars owned by the company, an abnormal number of its own cars being in use on other roads.

Operating Statistics of Large Steam Roads — Selected Items for the Month of August, 1922,

| Region, road and year | Average miles of road operated | Train-miles | Locomotive-miles | | Car-miles | | Ton-miles (thousands) | | Average number of locomotives on line daily | | | | |
|---------------------------------|--------------------------------|-------------|----------------------|-----------|--------------------|-----------------|--|------------------------------|---|------------------|--------------------------|--------|-----|
| | | | Principal and helper | Light | Loaded (thousands) | Per cent loaded | Gross. Excluding locomotive and tender | Net. Revenue and non-revenue | Serv-ice-able | Un-serv-ice-able | Per cent unserv-ice-able | Stored | |
| New England Region: | | | | | | | | | | | | | |
| Boston & Albany..... | 1922 | 394 | 252,014 | 265,245 | 24,786 | 4,928 | 73.3 | 229,689 | 87,565 | 110 | 32 | 22.6 | ... |
| | 1921 | 394 | 237,289 | 256,462 | 29,707 | 4,479 | 65.8 | 232,576 | 90,975 | 123 | 29 | 19.1 | ... |
| Boston & Maine..... | 1922 | 2,455 | 514,072 | 574,956 | 49,658 | 12,095 | 77.7 | 548,396 | 222,885 | 319 | 127 | 28.4 | 32 |
| | 1921 | 2,469 | 509,399 | 564,573 | 46,610 | 11,094 | 70.6 | 561,444 | 230,743 | 325 | 132 | 28.9 | 62 |
| N. Y., N. H. & Hartford..... | 1922 | 1,959 | 430,654 | 468,405 | 28,604 | 11,550 | 75.3 | 528,533 | 217,013 | 248 | 98 | 28.4 | 4 |
| | 1921 | 1,960 | 452,517 | 487,934 | 30,355 | 10,498 | 66.9 | 537,299 | 222,152 | 309 | 79 | 20.3 | 45 |
| Great Lakes Region: | | | | | | | | | | | | | |
| Delaware & Hudson..... | 1922 | 887 | 234,728 | 312,812 | 31,878 | 6,825 | 77.9 | 361,256 | 175,266 | 251 | 51 | 17.0 | 172 |
| | 1921 | 880 | 339,246 | 445,083 | 33,260 | 8,556 | 62.2 | 561,387 | 276,773 | 276 | 35 | 11.3 | 114 |
| Del., Lack. & Western..... | 1922 | 994 | 428,168 | 510,235 | 100,473 | 14,105 | 73.3 | 701,914 | 302,205 | 271 | 92 | 25.3 | 24 |
| | 1921 | 995 | 511,787 | 625,962 | 115,829 | 15,943 | 69.9 | 875,637 | 416,323 | 303 | 56 | 15.5 | 46 |
| Erie (inc. Chic. & Erie)..... | 1922 | 2,309 | 777,452 | 844,068 | 74,107 | 27,099 | 72.0 | 1,469,102 | 648,421 | 476 | 278 | 36.9 | 45 |
| | 1921 | 2,259 | 951,327 | 1,066,507 | 48,796 | 31,682 | 67.6 | 1,867,603 | 859,152 | 550 | 177 | 24.3 | 53 |
| Lehigh Valley | 1922 | 1,316 | 489,956 | 545,908 | 80,931 | 14,723 | 74.6 | 777,746 | 367,949 | 402 | 164 | 28.9 | 102 |
| | 1921 | 1,316 | 559,876 | 614,036 | 59,717 | 15,883 | 62.9 | 963,836 | 431,654 | 439 | 107 | 19.6 | 129 |
| Michigan Central | 1922 | 1,827 | 517,260 | 524,737 | 24,227 | 18,444 | 72.5 | 905,995 | 376,718 | 306 | 94 | 23.6 | 73 |
| | 1921 | 1,829 | 449,153 | 457,183 | 18,260 | 13,836 | 66.3 | 742,532 | 298,868 | 329 | 83 | 20.2 | 111 |
| New York Central..... | 1922 | 5,675 | 1,559,945 | 1,745,118 | 140,613 | 61,077 | 72.3 | 3,180,883 | 1,381,143 | 822 | 765 | 48.2 | 131 |
| | 1921 | 5,655 | 1,677,716 | 1,856,719 | 133,471 | 59,097 | 62.3 | 3,435,800 | 1,455,922 | 977 | 622 | 38.9 | 248 |
| N. Y., Chic. & St. Louis..... | 1922 | 1,225 | 471,183 | 475,640 | 3,097 | 13,967 | 75.6 | 680,009 | 290,419 | 151 | 73 | 32.6 | 23 |
| | 1921 | 1,225 | 424,529 | 428,219 | 1,610 | 12,182 | 68.1 | 625,415 | 253,836 | 187 | 80 | 29.8 | 69 |
| Pere Marquette | 1922 | 2,182 | 327,065 | 334,116 | 5,637 | 8,585 | 73.4 | 440,611 | 203,542 | 144 | 65 | 31.1 | 1 |
| | 1921 | 2,196 | 345,847 | 351,558 | 6,881 | 8,689 | 68.1 | 475,349 | 206,794 | 163 | 45 | 21.5 | 18 |
| Pitts. & Lake Erie..... | 1922 | 228 | 101,310 | 106,222 | 1,046 | 3,639 | 73.9 | 232,084 | 139,561 | 57 | 24 | 29.6 | 10 |
| | 1921 | 225 | 67,273 | 70,156 | 599 | 2,374 | 63.9 | 166,136 | 93,149 | 59 | 27 | 31.5 | 22 |
| Wabash | 1922 | 2,418 | 463,090 | 483,844 | 5,680 | 14,613 | 80.5 | 697,116 | 316,499 | 262 | 83 | 24.0 | 14 |
| | 1921 | 2,418 | 595,359 | 627,690 | 9,632 | 16,308 | 68.5 | 874,616 | 372,818 | 276 | 71 | 20.4 | 39 |
| Ohio-Indiana-Allegheny Region: | | | | | | | | | | | | | |
| Baltimore & Ohio..... | 1922 | 5,235 | 1,177,378 | 1,348,092 | 90,190 | 31,367 | 70.5 | 1,814,318 | 910,367 | 648 | 730 | 53.0 | 10 |
| | 1921 | 5,185 | 1,671,430 | 1,772,764 | 137,693 | 40,623 | 61.2 | 2,690,838 | 1,322,018 | 1,002 | 393 | 28.2 | 192 |
| Central R. R. of N. J..... | 1922 | 689 | 255,424 | 278,906 | 33,946 | 5,190 | 71.1 | 290,934 | 132,667 | 204 | 56 | 21.4 | 30 |
| | 1921 | 679 | 264,944 | 297,263 | 40,173 | 6,237 | 62.6 | 390,283 | 192,294 | 206 | 56 | 21.3 | 14 |
| Chicago & Eastern Ill..... | 1922 | 945 | 197,323 | 199,655 | 2,646 | 4,952 | 73.9 | 256,559 | 125,525 | 92 | 76 | 45.1 | 23 |
| | 1921 | 1,131 | 246,902 | 248,431 | 3,895 | 5,803 | 62.2 | 354,866 | 177,114 | 127 | 49 | 27.7 | 46 |
| Clev., Cin., Chic. & St. L..... | 1922 | 2,378 | 549,221 | 571,096 | 13,239 | 18,783 | 73.0 | 1,039,042 | 508,022 | 234 | 217 | 48.1 | 1 |
| | 1921 | 2,382 | 626,808 | 652,912 | 2,912 | 17,213 | 60.4 | 1,067,098 | 468,447 | 299 | 143 | 32.4 | 32 |
| Elgin, Joliet & En..... | 1922 | 459 | 39,096 | 41,382 | 1,739 | 1,172 | 67.4 | 86,973 | 47,394 | 87 | 20 | 18.9 | 21 |
| | 1921 | 456 | 87,348 | 94,207 | 4,710 | 2,714 | 67.6 | 197,442 | 106,104 | 97 | 11 | 10.0 | 43 |
| Long Island | 1922 | 394 | 43,128 | 45,257 | 7,125 | 517 | 60.0 | 29,614 | 10,816 | 35 | 13 | 26.9 | ... |
| | 1921 | 395 | 46,290 | 53,044 | 8,585 | 588 | 59.5 | 32,861 | 12,833 | 35 | 10 | 22.6 | 1 |
| Pennsylvania System | 1922 | 10,903 | 4,467,630 | 4,822,558 | 359,104 | 126,883 | 71.0 | 7,590,867 | 3,775,994 | 2,500 | 880 | 26.0 | 328 |
| | 1921 | 10,877 | 3,944,882 | 4,278,363 | 300,264 | 100,933 | 63.8 | 6,776,305 | 3,376,523 | 2,615 | 854 | 24.6 | 843 |
| Philadelphia & Reading.... | 1922 | 1,119 | 458,335 | 498,566 | 51,954 | 11,427 | 69.4 | 681,402 | 347,554 | 416 | 72 | 14.8 | 239 |
| | 1921 | 1,119 | 503,999 | 568,105 | 70,229 | 12,390 | 63.5 | 835,302 | 432,337 | 367 | 85 | 18.9 | 168 |
| Pocahontas Region: | | | | | | | | | | | | | |
| Chesapeake & Ohio..... | 1922 | 2,551 | 533,380 | 585,045 | 13,582 | 15,551 | 61.7 | 1,157,772 | 635,651 | 336 | 210 | 38.5 | 35 |
| | 1921 | 2,548 | 641,697 | 694,937 | 20,147 | 18,473 | 58.3 | 1,395,262 | 749,688 | 456 | 102 | 18.3 | 126 |
| Norfolk & Western..... | 1922 | 2,228 | 824,720 | 980,237 | 38,397 | 21,544 | 57.7 | 1,778,131 | 972,189 | 552 | 173 | 23.9 | 96 |
| | 1921 | 2,221 | 665,948 | 800,708 | 29,845 | 18,164 | 60.1 | 1,373,981 | 744,037 | 614 | 89 | 12.5 | 216 |
| Southern Region: | | | | | | | | | | | | | |
| Atlantic Coast Line..... | 1922 | 4,923 | 570,097 | 572,105 | 11,093 | 13,261 | 74.0 | 646,119 | 281,292 | 333 | 99 | 23.0 | 19 |
| | 1921 | 4,887 | 474,410 | 478,123 | 6,809 | 9,952 | 65.3 | 508,139 | 197,763 | 295 | 113 | 27.6 | 68 |
| Central of Georgia..... | 1922 | 1,907 | 233,976 | 235,799 | 3,463 | 4,873 | 77.9 | 242,123 | 114,637 | 120 | 13 | 9.5 | ... |
| | 1921 | 1,899 | 227,007 | 229,216 | 2,022 | 4,427 | 66.4 | 229,958 | 98,910 | 110 | 25 | 18.8 | 17 |
| I. Cent. (inc. Y. & M. V.)..... | 1922 | 6,135 | 2,038,510 | 2,087,787 | 51,540 | 58,110 | 69.8 | 3,453,492 | 1,649,617 | 746 | 95 | 11.3 | 5 |
| | 1921 | 6,151 | 1,549,470 | 1,555,055 | 30,251 | 40,852 | 62.9 | 2,579,683 | 1,147,793 | 712 | 95 | 11.8 | 16 |
| Louisville & Nashville..... | 1922 | 5,021 | 1,303,678 | 1,382,955 | 47,805 | 21,919 | 66.5 | 1,352,730 | 667,940 | 598 | 93 | 13.5 | ... |
| | 1921 | 5,020 | 1,461,786 | 1,556,544 | 55,523 | 25,033 | 59.6 | 1,625,062 | 766,006 | 551 | 103 | 15.8 | 37 |
| Seaboard Air Line..... | 1922 | 3,537 | 415,459 | 421,834 | 11,845 | 9,258 | 74.5 | 461,049 | 202,144 | 145 | 123 | 46.0 | ... |
| | 1921 | 3,537 | 351,147 | 360,355 | 6,708 | 7,156 | 71.2 | 355,145 | 144,844 | 166 | 90 | 35.2 | 6 |
| Southern Ry..... | 1922 | 6,942 | 1,016,017 | 1,039,377 | 35,459 | 21,709 | 77.1 | 1,059,658 | 474,999 | 790 | 253 | 24.3 | 9 |
| | 1921 | 6,942 | 1,181,316 | 1,202,071 | 24,863 | 24,955 | 66.2 | 1,322,754 | 553,821 | 879 | 239 | 21.4 | 65 |
| Northwestern Region: | | | | | | | | | | | | | |
| Chicago & N. Western..... | 1922 | 8,427 | 1,229,367 | 1,278,396 | 27,428 | 28,094 | 71.4 | 1,477,562 | 666,059 | 697 | 344 | 33.0 | 8 |
| | 1921 | 8,371 | 1,631,875 | 1,680,576 | 22,430 | 34,517 | 61.6 | 2,034,514 | 787,534 | 813 | 262 | 24.4 | 62 |
| Chicago, Milwau. & St. P..... | 1922 | 11,027 | 1,637,844 | 1,686,244 | 81,451 | 42,506 | 72.4 | 2,216,316 | 1,031,607 | 777 | 286 | 26.9 | 83 |
| | 1921 | 10,992 | 1,590,480 | 1,631,684 | 64,028 | 38,862 | 66.6 | 2,175,658 | 992,748 | 880 | 208 | 19.1 | 137 |
| Chic., St. P., Minn. & Om..... | 1922 | 1,726 | 378,126 | 411,167 | 19,979 | 7,107 | 72.9 | 378,065 | 167,228 | 153 | 67 | 30.4 | 11 |
| | 1921 | 1,726 | 345,988 | 366,270 | 15,005 | 6,481 | 69.0 | 354,545 | 155,939 | 156 | 57 | 26.6 | 23 |
| Great Northern | 1922 | 8,255 | 886,916 | 910,090 | 38,569 | 27,099 | 65.8 | 1,636,290 | 838,499 | 551 | 174 | 24.0 | 67 |
| | 1921 | 8,159 | 832,665 | 853,050 | 26,049 | 23,038 | 64.4 | 1,386,607 | 664,005 | 592 | 189 | 24.2 | 215 |
| Minn., St. P. & S. Ste. M..... | 1922 | 4,355 | 581,660 | 587,927 | 10,749 | 14,377 | 76.4 | 673,271 | 324,699 | 347 | 57 | 14.1 | ... |
| | 1921 | 4,360 | 468,897 | 498,523 | 7,404 | 10,428 | 72.4 | 518,444 | 227,380 | 342 | 61 | 15.1 | 28 |
| Northern Pacific | 1922 | 6,388 | 924,202 | 961,351 | 45,775 | 26,749 | 75.2 | 1,419,987 | 680,113 | 588 | 135 | 18.7 | 81 |
| | 1921 | 6,408 | 783,139 | 819,334 | 51,365 | 22,465 | 66.8 | 1,270,885 | 565,385 | 542 | 157 | 22.4 | 114 |
| Oreg.-Wash. R. R. & Nav..... | 1922 | 2,143 | 233,077 | 259,431 | 39,596 | 5,706 | 72.5 | 324,295 | 154,921 | 125 | 35 | 20.6 | 7 |
| | 1921 | 2,198 | 220,651 | 245,655 | 33,689 | 5,529 | 71.3 | 320,825 | 156,846 | 119 | 40 | | |

Compared with August, 1921, for Roads with Annual Operating Revenues Above \$25,000,000.

| Region, road and year | Average number of freight cars on line daily | | | Per cent un- service able | Gross tons per train, excluding locomotive and tender | Net tons per train | Net tons per loaded car | Net ton- miles per car-day | Car- miles per car-day | Pounds of net ton- miles of road per day | Pounds of net ton- miles, 1,000 gross ton-miles, including locomotive and tender | Passenger service | |
|---|---|---------|---------|------------------------------------|--|-----------------------------|-------------------------------------|--|---------------------------------|--|--|-------------------|----------------------------------|
| | Home | Foreign | Total | | | | | | | | | Train- miles | Passenger- train car-miles |
| New England Region: | | | | | | | | | | | | | |
| Boston & Albany.....1922 | 2,605 | 5,133 | 7,738 | 6.4 | ..... | 911 | 347 | 17.8 | 365 | 28.0 | 7,171 | 312,761 | 1,975,708 |
| 1921 | 3,475 | 3,672 | 7,147 | 7.9 | 845 | 980 | 383 | 20.3 | 411 | 30.7 | 7,450 | 194 | 306,350 |
| Boston & Maine.....1922 | 15,203 | 14,769 | 29,972 | 18.8 | 947 | 1,067 | 434 | 18.4 | 240 | 16.8 | 2,928 | 161 | 919,028 |
| 1921 | 18,216 | 11,948 | 30,164 | 21.8 | 2,195 | 1,102 | 453 | 20.8 | 247 | 16.8 | 3,015 | 145 | 962,179 |
| N. Y., N. H. & Hartford.....1922 | 22,549 | 19,048 | 41,597 | 23.3 | 303 | 1,227 | 504 | 18.8 | 168 | 11.9 | 3,574 | 167 | 1,087,778 |
| 1921 | 25,719 | 13,059 | 38,778 | 25.8 | 1,395 | 1,187 | 491 | 21.2 | 185 | 13.1 | 3,657 | 157 | 1,116,929 |
| Great Lakes Region: | | | | | | | | | | | | | |
| Delaware & Hudson.....1922 | 12,297 | 5,807 | 18,104 | 7.7 | 5,907 | 1,539 | 747 | 25.7 | 312 | 15.6 | 6,374 | 200 | 225,215 |
| 1921 | 11,007 | 4,907 | 15,914 | 14.6 | 817 | 1,655 | 816 | 32.3 | 561 | 27.9 | 10,141 | 180 | 226,428 |
| Del., Lack. & Wn.....1922 | 15,780 | 9,555 | 25,335 | 13.4 | 781 | 1,639 | 706 | 21.4 | 385 | 24.5 | 9,807 | 186 | 510,094 |
| 1921 | 17,921 | 7,788 | 25,709 | 15.7 | 44 | 1,711 | 813 | 26.1 | 522 | 28.6 | 13,503 | 162 | 516,284 |
| Erie (inc. Chic. & Erie).....1922 | 31,891 | 22,928 | 54,819 | 17.6 | 1,853 | 1,890 | 834 | 23.9 | 382 | 22.1 | 9,057 | 146 | 663,179 |
| 1921 | 39,032 | 15,265 | 54,297 | 21.9 | 8,884 | 1,963 | 903 | 27.1 | 510 | 27.9 | 12,270 | 134 | 686,855 |
| Lehigh Valley .....1922 | 30,012 | 13,800 | 43,812 | 11.5 | 3,778 | 1,587 | 751 | 25.0 | 271 | 14.5 | 9,017 | 188 | 358,147 |
| 1921 | 31,731 | 7,887 | 39,618 | 9.3 | 2,711 | 1,722 | 771 | 27.2 | 351 | 20.6 | 10,578 | 159 | 390,892 |
| Michigan Central .....1922 | 12,435 | 16,512 | 28,947 | 14.6 | ..... | 1,752 | 728 | 20.4 | 420 | 28.3 | 6,653 | 108 | 603,770 |
| 1921 | 19,039 | 13,448 | 32,487 | 21.9 | 239 | 1,653 | 665 | 21.6 | 297 | 20.7 | 5,270 | 119 | 623,114 |
| New York Central.....1922 | 68,207 | 56,711 | 124,918 | 14.6 | 8,398 | 2,039 | 885 | 22.6 | 357 | 21.8 | 7,851 | 131 | 2,507,035 |
| 1921 | 88,935 | 46,016 | 134,951 | 17.8 | 16,987 | 2,048 | 868 | 24.6 | 348 | 22.7 | 8,305 | 116 | 2,455,237 |
| N. Y., Chic. & St. L.....1922 | 4,054 | 8,841 | 12,895 | 16.8 | ..... | 1,443 | 616 | 20.8 | 727 | 46.2 | 7,645 | 123 | 155,930 |
| 1921 | 7,696 | 7,095 | 14,791 | 23.0 | 732 | 1,473 | 598 | 20.8 | 554 | 39.0 | 6,682 | 105 | 155,502 |
| Pere Marquette .....1922 | 8,731 | 12,575 | 21,306 | 13.4 | ..... | 1,347 | 622 | 23.7 | 308 | 17.7 | 3,010 | 122 | 222,090 |
| 1921 | 11,394 | 11,075 | 22,469 | 18.2 | 500 | 1,375 | 598 | 23.8 | 297 | 18.3 | 3,038 | 124 | 343,326 |
| Pitts. & Lake Erie.....1922 | 16,611 | 10,028 | 26,639 | 34.7 | 3,651 | 2,291 | 1,378 | 38.4 | 169 | 6.0 | 19,752 | 90 | 116,019 |
| 1921 | 19,995 | 7,428 | 27,423 | 36.1 | 1,749 | 2,470 | 1,385 | 39.2 | 110 | 4.4 | 13,377 | 75 | 110,661 |
| Wabash .....1922 | 9,921 | 12,582 | 22,503 | 11.1 | 253 | 1,505 | 683 | 21.7 | 454 | 26.0 | 4,223 | 136 | 373,762 |
| 1921 | 11,992 | 11,261 | 23,253 | 11.4 | 644 | 1,469 | 626 | 22.9 | 517 | 33.0 | 4,974 | 148 | 532,903 |
| Ohio-Indiana-Allegheny Region: | | | | | | | | | | | | | |
| Baltimore & Ohio .....1922 | 62,688 | 41,862 | 104,550 | 14.2 | 2,980 | 1,541 | 773 | 29.0 | 281 | 13.7 | 5,610 | 220 | 1,313,255 |
| 1921 | 69,973 | 29,422 | 99,395 | 10.6 | 3,926 | 1,610 | 791 | 32.5 | 429 | 21.5 | 8,225 | 177 | 1,416,158 |
| Central R. R. of N. J. ....1922 | 18,657 | 9,361 | 28,018 | 5.9 | 10,701 | 1,139 | 519 | 24.2 | 153 | 8.9 | 6,212 | 224 | 417,138 |
| 1921 | 19,993 | 8,345 | 28,338 | 20.4 | 4,896 | 1,473 | 726 | 30.8 | 219 | 11.3 | 9,142 | 181 | 403,970 |
| Chicago & Eastern Ill. ....1922 | 13,375 | 4,593 | 17,968 | 18.2 | 474 | 1,300 | 636 | 25.3 | 225 | 12.0 | 4,284 | 160 | 186,175 |
| 1921 | 14,482 | 3,895 | 18,377 | 13.2 | 846 | 1,437 | 717 | 30.5 | 311 | 16.4 | 5,052 | 154 | 223,873 |
| Clev., Cin., Chic. & St. L.....1922 | 15,700 | 21,990 | 37,690 | 15.3 | 4,277 | 1,892 | 925 | 27.0 | 435 | 22.0 | 6,892 | 122 | 707,658 |
| 1921 | 17,651 | 15,034 | 32,685 | 13.2 | 262 | 1,702 | 747 | 27.2 | 462 | 28.1 | 6,344 | 127 | 734,657 |
| Elgin, Joliet & En. ....1922 | 8,973 | 5,648 | 14,621 | 16.0 | ..... | 2,225 | 1,225 | 40.9 | 106 | 3.8 | 3,365 | 102 | (1) |
| 1921 | 9,726 | 3,988 | 13,714 | 8.1 | 1,915 | 2,260 | 1,215 | 39.1 | 250 | 9.4 | 7,500 | 113 | (1) |
| Long Island .....1922 | 2,061 | 3,008 | 5,069 | 5.4 | ..... | 687 | 251 | 20.9 | 69 | 5.5 | 885 | 330 | 230,028 |
| 1921 | 2,150 | 2,925 | 5,075 | 4.0 | 193 | 710 | 277 | 21.8 | 82 | 6.3 | 1,049 | 312 | 227,514 |
| Pennsylvania System .....1922 | 180,452 | 101,216 | 281,668 | 13.9 | 12,622 | 1,699 | 845 | 29.8 | 432 | 20.5 | 11,172 | 145 | 5,316,096 |
| 1921 | 219,759 | 64,071 | 283,830 | 14.3 | 57,670 | 1,718 | 856 | 33.5 | 384 | 18.0 | 10,013 | 133 | 5,401,592 |
| Phila. & Reading .....1922 | 20,519 | 11,625 | 32,144 | 5.3 | 5,555 | 1,487 | 758 | 30.4 | 349 | 16.5 | 10,017 | 185 | 515,606 |
| 1921 | 27,653 | 10,362 | 38,015 | 7.1 | 8,778 | 1,657 | 858 | 34.9 | 367 | 16.6 | 12,459 | 172 | 542,724 |
| Poconos Region: | | | | | | | | | | | | | |
| Chesapeake & Ohio .....1922 | 32,747 | 17,940 | 50,687 | 16.5 | 476 | 2,171 | 1,192 | 40.9 | 405 | 16.0 | 8,039 | 129 | 451,090 |
| 1921 | 40,496 | 9,764 | 50,260 | 9.3 | 3,100 | 2,174 | 1,168 | 40.6 | 481 | 20.3 | 9,490 | 126 | 453,512 |
| Norfolk & Western .....1922 | 28,042 | 14,253 | 42,295 | 6.5 | ..... | 2,156 | 1,179 | 45.1 | 741 | 28.5 | 14,077 | 175 | 398,299 |
| 1921 | 36,635 | 5,272 | 41,907 | 9.6 | 4,868 | 2,063 | 1,117 | 41.0 | 573 | 23.2 | 10,807 | 165 | 418,427 |
| Southern Region: | | | | | | | | | | | | | |
| Atlantic Coast Line .....1922 | 13,497 | 9,369 | 22,866 | 19.0 | ..... | 1,133 | 493 | 21.2 | 397 | 25.3 | 1,843 | 123 | 700,892 |
| 1921 | 21,222 | 5,792 | 27,014 | 24.2 | ..... | 1,071 | 417 | 19.9 | 236 | 18.2 | 1,305 | 135 | 708,278 |
| Central of Georgia .....1922 | 2,408 | 4,414 | 6,822 | 16.1 | ..... | 1,035 | 490 | 23.5 | 542 | 29.6 | 1,939 | 164 | 328,703 |
| 1921 | 4,677 | 3,313 | 7,990 | 14.4 | ..... | 1,013 | 436 | 22.3 | 399 | 26.9 | 1,672 | 147 | 320,502 |
| Illinois Central (inc. Yazoo & M. V.).....1922 | 31,145 | 35,778 | 66,923 | 9.5 | 2,573 | 1,694 | 809 | 28.4 | 795 | 40.1 | 8,674 | 131 | 1,468,676 |
| 1921 | 44,346 | 19,336 | 63,682 | 12.8 | 3,858 | 1,665 | 741 | 28.1 | 581 | 32.9 | 6,019 | 132 | 1,442,874 |
| Louisville & Nashville .....1922 | 27,572 | 21,409 | 48,981 | 12.5 | 66 | 1,038 | 512 | 30.5 | 440 | 21.7 | 4,291 | 191 | 1,006,403 |
| 1921 | 39,859 | 14,773 | 54,632 | 29.3 | 90 | 1,112 | 524 | 30.6 | 452 | 24.8 | 4,922 | 159 | 943,548 |
| Seaboard Air Line .....1922 | 11,194 | 12,585 | 23,779 | 35.0 | ..... | 1,110 | 487 | 21.8 | 274 | 16.9 | 1,843 | 170 | 433,746 |
| 1921 | 11,628 | 6,162 | 17,790 | 32.2 | ..... | 1,011 | 413 | 20.2 | 263 | 18.2 | 1,321 | 186 | 563,749 |
| Southern Ry. ....1922 | 31,263 | 38,831 | 70,094 | 15.3 | ..... | 1,043 | 468 | 21.9 | 219 | 13.0 | 2,207 | 213 | 1,302,972 |
| 1921 | 39,746 | 17,846 | 57,592 | 13.5 | 2,208 | 1,128 | 469 | 22.2 | 310 | 21.1 | 2,574 | 197 | 1,329,184 |
| Northwestern Region: | | | | | | | | | | | | | |
| Chic. & N. Wn. ....1922 | 40,811 | 32,890 | 73,701 | 9.3 | ..... | 1,202 | 542 | 23.7 | 292 | 17.2 | 2,550 | 160 | 1,405,293 |
| 1921 | 49,102 | 26,241 | 75,343 | 10.0 | 6,679 | 1,247 | 483 | 22.8 | 337 | 24.0 | 3,035 | 161 | 1,675,159 |
| Chic., Milw. & St. P. ....1922 | 45,889 | 26,725 | 72,614 | 18.7 | ..... | 1,353 | 629 | 24.3 | 458 | 26.1 | 3,016 | 136 | 1,485,783 |
| 1921 | 49,760 | 26,125 | 75,885 | 19.1 | 3,261 | 1,368 | 624 | 25.5 | 422 | 24.8 | 2,913 | 145 | 1,545,941 |
| Chic., St. P., Minneap. & Om. ....1922 | 3,540 | 10,108 | 13,648 | 14.2 | 47 | 1,000 | 442 | 23.5 | 395 | 23.0 | 3,125 | 147 | 270,297 |
| 1921 | 4,378 | 11,504 | 15,882 | 15.7 | 2,516 | 1,025 | 451 | 24.1 | 317 | 19.1 | 2,914 | 152 | 324,986 |
| Great Northern .....1922 | 45,140 | 12,268 | 57,408 | 11.6 | ..... | 1,845 | 945 | 30.9 | 471 | 23.2 | 3,277 | 122 | 883,051 |
| 1921 | 46,796 | 6,200 | 52,996 | 14.2 | ..... | 1,665 | 797 | 28.8 | 404 | 21.8 | 2,625 | 142 | 1,008,463 |
| Minneap., St. P. & S. Ste. M. ....1922 | 17,905 | 7,248 | 25,153 | 8.3 | 2,613 | 1,157 | 558 | 22.6 | 416 | 24.1 | 2,405 | 100 | 435,698 |
| 1921 | 20,733 | 5,765 | 26,498 | 11.6 | 5,034 | 1,106 | 506 | 22.8 | 289 | 17.5 | 1,757 | 129 | 447,454 |
| Northern Pacific .....1922 | 32,756 | 11,402 | 44,158 | 15.2 | 419 | 1,536 | 736 | 25.4 | 497 | 26.0 | 3,434 | 109 | 701,505 |
| 1921 | 38,416 | 6,939 | 45,355 | 15.8 | 4,999 | 1,623 | 722 | 25.2 | 402 | 23.9 | 2,846 | 126 | 862,652 |
| Oreg.-Wash. R. R. & Nav. ....1922 | 5,963 | 3,642 | 9,605 | 1.9 | ..... | 1,391 | 665 | 27.2 | 520 | 26.4 | 2,332 | 206 | 262,181 |
| 1921 | 6,755 | 3,502 | 10,257 | 3.9 | 1,521 | 1,454 | 711 | 28.4 | 493 | 24.4 | 2,302 | 199 | 257,749 |
| Central Western Region: | | | | | | | | | | | | | |
| Atch., Top. & S. Fe .....1922 | 44,621 | 19,154 | 63,775 | | | | | | | | | | |

Striking Shopmen Reopen Relations

With the Labor Board

The first move to reestablish relations between the Railroad Labor Board and the Railway Employees' Department of the American Federation of Labor was made on October 21 when B. M. Jewell, leader of the shopmen's strike, called upon Chairman B. W. Hooper of the Board and gave notice that the shopcrafts would present a petition for the reopening of a case against the New York Central, involving the question of the piece work system in the Elkhart (Ind.) shops. It was unofficially intimated at the board that Mr. Jewell's petition would be granted and that the Labor Board would resume its status as umpire in disputes affecting this organization and those roads on which it still retains a majority of the shop workers.

The Daugherty Injunction

The legal battle over the "Daugherty Injunction," restraining striking railway shopmen from interfering with commerce or with the operation of railway shops, continues at Chicago, despite the fact that the shopmen's strike is now practically a matter of history. Donald R. Richberg, attorney for the shopmen, on October 19, filed a motion before Federal Judge James H. Wilkerson to dissolve the interlocutory injunction obtained by Attorney General Daugherty. The principal plea for the shopmen at that time was that "the conditions described in the bill of complaint, if they ever existed, no longer exist," because a large number of the railroads and the workers involved have settled their differences. Following this plea several continuances were made and at the present time hearings on Mr. Richberg's motion are set for November 6.

Collision at Toltec, New Mexico

On the Denver & Rio Grande Western at Toltec, N. M., on September 29, there occurred a collision which, according to the report of the inspector of the Interstate Commerce Commission, may be classed as due to error in reading a meeting order which was not properly punctuated (though, of course, everybody recognizes that train orders are never punctuated). This collision occurred on a narrow gage line and the trains met on a curve of eight degrees where, on account of rock bluffs, the range of vision is restricted to about 60 ft. The trains were moving at between 15 and 20 miles an hour; engineman and fireman of passenger train killed and 21 passengers and two employees injured. West-bound passenger No. 115 met eastbound locomotive No. 411 (without train). Engineman Smith, of No. 411 had received the following order:

No 115 Eng 169 run
one 1 hour late Lava
to Osier fifty 50 mins
late Osier to Cumbres

On receiving this order, Smith "glanced at it" and got into his mind the impression that No. 115 was one hour and 50 minutes late. He claims that he thus remarked to the operator and that the operator nodded assent; but the operator claims that this and other orders were read to him by the engineman and that the reading was correct. While the engineman was reading the other orders, the fireman entered, and read this one aloud. He seems also to have got the same impression. Thus they encroached on the time of the passenger train. The report calls attention, as in previous similar cases, to the "inherent deficiency of the time interval system."

First Aid Training on the D. & H.

A tournament of the Delaware & Hudson First Aid Teams was held at Hotel Champlain, Bluff Point, N. Y., on September 7, during the annual meeting of the Delaware & Hudson Company Freight and Ticket Agents' Association. In 1919 the Delaware & Hudson Company created a department for the education of its employees in the matter of personal safety, under the direction of J. E. Long, and the work of the department was in 1920 extended to embrace first aid work; and today some 260 certificates of proficiency have been issued. This was the first public demonstration. Contests are to be held annually between teams representing the different divisions of the railroad.

By a process of elimination four teams, consisting of a captain and four men each, met in the finals of the tournament at Bluff Point. The contest consisted in working out eight problems in first aid, with Dr. Larkin, company surgeon, at Plattsburg, acting as judge. Of a possible 800 points, the team from Wilkes-Barre, Pa., representing the Pennsylvania division, scored 781, the Saratoga division 778, the Champlain division 770, and the Susquehanna division 766.

There has been a marked decrease in the number of accidents to employees. In 1921 there were only ten fatalities among all the employees of the entire system.

Work Progressing on P. & R.'s New Camden Terminal

Approximately 150,000 cubic yards of earth have already been filled in on the site of the new terminal of the Philadelphia & Reading seashore lines at Kaighns Point, Camden, N. J. It is expected that the fill-in will have been completed, the tracks laid, and the new terminal ready for service during the 1923 summer season. The entire site of the new terminal was under high tide three years ago. The area which the new terminal and its yards will cover is approximately 1,800 feet long and 700 feet wide. The filling in is being done by the American Dredging Company. The material used is being brought up by hydraulic pressure from the bottom of the Delaware River 30 feet below the surface of the water. The plans for the new terminal call for a modern two-story structure of steel frame and brick with



At Work on New P. & R. Terminal at Camden, N. J.

stone trimmings on a concrete foundation, built on piles. It will house the ferry slips, a large train shed and concourse, waiting rooms for men and women, a restaurant and the offices of the Delaware River Ferry Company, and of the seashore lines of the Philadelphia & Reading Railway. There will be ten platform tracks for use in the company's regular service and four additional tracks for use at times when travel is especially heavy. Each of these tracks will be gated and practically all of them will be long enough to accommodate a train of 14 cars. Extensive driveways leading into the terminal will be laid out, each of them wide enough to accommodate four lines of vehicles. There will be separate driveways for baggage and express. Adjoining the terminal proper will be large storage yard for cars and a Y. M. C. A. building for the use of trainmen.

Improper Billing for Foreign Car Repairs

The American Railway Association has issued a circular calling attention to the lack of compliance with the rules regarding billing for foreign car repairs and determining the responsibility for damage to foreign equipment necessitating repairs. This difficulty, the circular states, is largely due to incomplete supervision, lack of knowledge of the rules on the part of local shop officers and, in some instances, to improper practices. Railroad executives are urged to provide such supervision as will insure the proper observance of the Rules of Interchange with respect to repairs to foreign cars and billing therefor.

The Mechanical Division of the association has a small force of inspectors investigating these conditions. This work will be continued and in addition to calling the attention of the officers of the railroads concerned to the conditions found, similar reports will be made quarterly to the board of directors of the association.

Bridge and Building Association

Selects Subjects for Next Year

At the closing session of the thirty-second annual convention of the American Railway Bridge and Building Association at Cincinnati, Ohio, on October 19, the following subjects were selected for investigation and report during the ensuing year:

The repair and renewal of ballast deck trestles.

Water facilities at stock yards—other construction and maintenance.

Methods of installing or replacing sewers and pipe lines under traffic.

The heating of small passenger stations.

Tool equipment for bridge building and water service maintenance gangs.

The relative merits of cast iron, concrete and corrugated metal pipe culverts.

The practicability of a uniform paint program for the entire year.

Specifications of bridge and building forces.

Seattle was the unanimous choice as the location for the next meeting, this point being selected because of the rapidly increasing use of western timber in bridge and building work and the desire of the members to study this timber in the forest and observe its manufacture into lumber for their use.

The Bridge and Building Supply Men's Association elected the following officers for the ensuing year. President, G. R. McVay, the Barrett Company, Chicago; vice-president, A. J. Filkins, the Paul Dickinson Company, Chicago; secretary, John Nelson, Joseph E. Nelson & Sons, Chicago; treasurer, D. J. Higgins, the American Valve & Meter Company, Chicago; directors, T. W. Snow, the T. W. Snow Construction Company, Chicago; F. M. Condit, Fairbanks, Morse & Co., Chicago; C. H. Hunsacker, the Massey Company, St. Louis; H. C. Brown, Chicago Bridge & Iron Works, New York City.

Block Signals and Train Speed

Control on the C. & N. W.

The Chicago & North Western has awarded a contract to the General Railway Signal Company, Rochester, N. Y., for the installation of automatic block signals, with train speed control, from West Chicago, Ill., north to Elgin, a distance of 12 miles.

The line is double track from West Chicago to Wayne, five miles, and the balance is single track. The double track will be equipped with Model 2A, direct current signals located on bridges and the single track will be equipped with the absolute permissive block system, Model 2A direct current signals being mounted on masts in the usual manner. The system of automatic train control will be the General Railway Signal Company's train speed control, described in the *Railway Age* of March 4, 1922, page 521.

Fixed limited speed is to be imposed at certain locations, as approaching the end of double track and interlocking plants, i.e., there are certain fixed speed limitations that are in effect which will be enforced through the use of pairs of inductors without windings. The speed control scheme generally contemplates the use of three pairs of inductors governing the approach to stop signals which force the deceleration of trains to insure a safe stop. Speed will be so tapered as to handle the trains as they are normally handled now, automatic braking being used only when speed limits are exceeded.

There is an interlocking plant a short distance from the West Chicago station from which it has been customary, under certain traffic conditions, to advance trains to the station on "Call-on" signals. The limited speed indicated by the "Call-on" signals will be enforced by the application of pairs of inductors suitably placed between the interlocking plant and West Chicago station.

The speed control and receiving apparatus will be the same for freight and for passenger locomotives, except for the timing of the time element contactor. Locomotives that may be used in either passenger or freight service will be equipped with time element contactors that may be adjusted for either class of service.

Traffic News

Intrastate passenger fares in Alabama will, from November 15, be calculated at three cents a mile, in compliance with an order of the Public Service Commission of the State issued some months ago. The railroads, by way of protest, asked the Interstate Commerce Commission to investigate the matter with a view to forbidding the reduction proposed by the State Commission, but the Federal body has decided that no hearing will be given on the petition of the railroads, and the State Commission now announces that no further delay will be permitted.

Loading of bituminous coal on Monday was the largest since December 20, 1920, according to reports received by the Car Service Division of the American Railway Association. The total was 43,243 cars, an increase of 2,042 cars over the total for Monday, October 16, which up to that time had marked the high point reached in bituminous coal loading since the miners' strike. The loading on Monday eclipsed the daily average for October last year by approximately 12,200 cars, and also was approximately 13,000 cars in excess of the daily average for the first three weeks in October this year.

Anthracite loading on Monday amounted to 6,398 cars. This exceeded the previous Saturday by 93 cars, and also surpassed the daily average loading for the first three weeks this month by more than 200 cars. It also was approximately 500 cars above the daily average for October, 1920, and 1921.

Chicago Shippers Meet November 7

The annual meeting of the Chicago Shippers' Conference Association will be held at Hotel La Salle in that city on November 7. This association was organized some years ago by the principal industrial concerns of the Chicago district in order to co-operate with the carriers in the handling of freight. The business of the organization is done through committees which deal with similar committees appointed by the railroads.

Want Competing Express Company in Chicago

The Chicago Association of Commerce has issued a circular containing a plea for the entrance of the Southeastern Express Company into Chicago to compete with the American Railway Express Company. The circular says in part:

"At the present time Chicago is served only by the American Railway Express Company. The Southeastern Express Company, is operating over the following lines: Southern; Mobile & Ohio; Tennessee Central; Maryland & Pennsylvania; Washington, Baltimore & Annapolis Electric; Merchants & Miners Transportation Company and Baltimore & Philadelphia Steamboat Company.

"We have received complaints from Chicago shippers of the refusal of the American Railway Express Company to respect routing via the Ohio River gateway over the most direct routes even though a detour of many miles is necessary in order that the American may enjoy the longest possible haul. The final link of the journey is made by the Southeastern, resulting in delays from 24 to 72 hours. The Southeastern has a through line to St. Louis to New York City and to Cincinnati as well as to other cities competing with Chicago for business throughout the Southeast. Please advise by letter if you are interested in having the Southeast enter this market and state the approximate annual tonnage that could move via this route, and if you will support such a service if it is established."

Rate Hearings by Trunk Line Association

The Trunk Line Association began in New York City this week hearings on a proposed general revision of the freight rate structure throughout trunk line territory, invitations having been sent to all interested mercantile organizations. At the first session, the principal speaker was J. C. Lincoln, of the Merchants Association, New York City, who argued that rates on the trunk lines within 500 miles of New York ought to be lower than in New England and in some other territory where advances in

rates had been authorized because of the precarious financial condition of the roads. He thought also that the starting point for the proposed new rates was wrong, the minimum rate of 30 cents per 100 lb. for carload freight for the shortest distance being too high. Arguments of Mr. Lincoln and others protesting against the increase of any rates were replied to by R. N. Collyer, chairman, with the statement that the only purpose of the proposed revision was to clarify the rate structure. Representatives of commercial interests were present from Philadelphia, Rochester, Boston, Buffalo, Brooklyn, Trenton and other places. H. C. Bixler appeared for the Port of New York authority.

George P. Wilson appearing for the Philadelphia Chamber of Commerce expressed the opinion that the carriers and the shippers are getting a little closer together. He said that his constituents were very much interested in knowing how the committee had ascertained the key rate, for upon that answer depends what would be the shippers' views with respect to the application of the rates to particular traffic. Continuing, he said:

"We are much concerned with respect to the accuracy of the distances to be used. We have been informed that some errors have occurred. Another important factor that must be considered in the construction of any rate base, is the relationship between communities; also the action to be taken with reference to industries located on branch lines. In any mileage scale the industry on the branch line is at a serious disadvantage with its competitor on the main line."

Coal Production

Complete returns on coal production in the third week of October show an increase to about 10,200,000 tons of soft coal, according to the weekly bulletin of the Geological Survey. Production of anthracite was at about the same rate as during the preceding week and will be at least 2,000,000 tons. Indications were, therefore, that the total of all coal raised during the week is about 12,200,000 tons.

The number of cars loaded on Monday, October 16, as reported by the railroads was 41,201 cars, establishing a new record for this year. Full returns on loadings for the week are expected to indicate production of 10,200,000 tons.

Transportation remains the limiting factor in the current rate of production.

Production of anthracite passed the 2-million ton mark in the second week of October. Preliminary reports to the American Railway Association show that 24,682 cars were loaded on the first four days of the week of October 16-21.

According to reports from the Northwestern Coal Dock Operators' Association the stocks of soft coal at Duluth, Superior, Ashland and Washburn increased from 120,384 net tons on September 1, to 1,034,520 tons on October 1. Stocks of anthracite declined from 14,475 to 12,370 tons.

The market was able to absorb all the coal that it was possible for the carriers to transport to market, and the only serious losses due to lack of demand were in Iowa and Missouri. In comparison with transportation losses, those due to other cause were negligible.

There has been a gradual decline in tonnage of soft coal dumped into vessels at Lake Erie piers since the week ended September 24 during which was established the high record in Lake traffic. The Ore and Coal Exchange reports the total handled during the week ended October 15 as 1,090,599 net tons as compared with 1,179,298 tons the week before. In comparison with the corresponding week a year ago this was an increase of 37 per cent. Of the total dumpings last week 1,052,043 tons were cargo coal and 38,556 tons were vessel fuel. During the present season to October 15, inclusive, 11,888,126 tons of cargo coal have been dumped into vessels at Lake Erie piers. The quantity sent to regular Lake markets this season is 38 per cent less than in 1921, 32 per cent less than in 1920, and 40 per cent less than in 1919.

According to reports received by the car service division of the American Railway Association coal loading for the week totaled 223,411 cars. This exceeded by 2,660 cars the week before which had marked the high point in coal loading. Loading of bituminous coal amounted to 186,295 cars. This was an increase of 3,806 cars over the week before. Anthracite loading amounted to 37,116 cars which was a decrease, however, of 1,446 under the week before.

Commission and Court News

Interstate Commerce Commission

The Interstate Commerce Commission has issued a decision finding that a proposed increased rate on iron and steel articles in carloads from Utah common points to certain destinations in California is not justified. The suspended schedules were ordered cancelled.

State Commissions

The Railroad Commission of California has addressed a letter to the Interstate Commerce Commission urging that body to visit California in order to obtain first hand information in connection with the Southern Pacific Company's application to retain control of the Central Pacific. This application was recently made following the unmerger decision and is based on the provisions of the Transportation Act of 1920 authorizing the Interstate Commerce Commission to permit railroad consolidations where they are found to be in the public interest. The letter says, in part: "You are aware, of course, that this matter is of great importance to the State of California. * * * We are the more ready to extend this urgent invitation because we know it is extremely difficult, if not impossible, to come to a correct understanding of the somewhat complicated factors from an oral and written record alone and as far away as Washington. If you should find it possible to make a personal investigation of the territory and property in question, the California Commission will be happy to extend to you, while in California, every facility at its disposal in a spirit of helpful co-operation."

Omnibuses Authorized to Compete With Railroads

The New York State Public Service Commission has issued a certificate of public convenience and necessity to an omnibus line running between Syracuse and Norwich, in spite of vigorous protests from parallel railroad lines, steam and electric. The decision was written by Commissioner Blakeslee. It is on the petition of Walter E. Aldrich for a certificate for the operation of a motor bus line between the cities of Norwich and Syracuse. Norwich is about 45 miles southeast of Syracuse.

The application was opposed by the New York Central, the Delaware, Lackawanna & Western, the New York, Ontario & Western, the Lehigh Valley, the Syracuse & Suburban and the New York State Railways.

The decision says: "The inception and growth of motor transportation is a natural development. Extensions of the improved highway system and betterments of good roads already built will continue for years to come. Consequently competition between motor buses and railroads in the transportation of freight and passengers will continue; and this will be true not only as to short haul traffic but with an increasing tendency to lengthen the distance of haul. This is a period of transition and to require those living at a distance from fixed railroad stations to journey to the stations and there await the arrival of trains, rather than to be allowed to take advantage of buses, stopping at their front doors, merely because this would result in financial loss to the established carrier (the railroad) is not in keeping with ideas of progress. . . . When more convenient and adequate service is offered to the public it would seem that necessity requires such public convenience should be served."

The commission, however, observes the wide discrepancy of taxation between railroads and their contributions toward the support of highways and the taxes paid by bus lines.

The route of the bus line extends from Norwich northerly through the Chenango Valley traversing a populous and prosperous rural community and running through numerous villages and over improved highways for the entire distance. Along the route are about 500 families living outside of villages who are not directly served by any other public carrier. The petitioner has been running over this route for two years but has suspended opera-

tions in the winter; last winter for a few weeks and the year before for three months. He operates three buses carrying 15 passengers each and three cars carrying six passengers each. The large buses are heated in winter. A regular time-table is followed and the chauffeurs have a share in the profits. The proprietor has an accident insurance policy for the benefit of passengers. He has snow ploughs with which he proposes to keep the roads open at all times. The present business is 75 to 100 passengers daily. The fare is higher than on the railroads for a comparable journey.

On the New York Central from Syracuse to Earlville, the business has fallen off since the buses began to run. The distance from Norwich to Syracuse by this line is 58 miles. The other steam railroads are less affected by the competition. The petitioner promises not to compete with the New York State railways in the city of Syracuse; and there are also other sections where he refrains from competing with local carriers.

The difficulties incident to unequal taxation of railroads and omnibus lines are discussed in the report, but are not settled, apparently being left for the legislature; the commission holds that all it has to decide is whether the proposed route is demanded by public convenience and a necessity.

In granting the petition, the commission prohibits competition with the local lines referred to and also with a bus line owned and operated by Nellie E. Bushley, of Norwich, who has a certificate to run between Oxford and Sherburne, through Norwich.

Court News

Fireman's Primary Duty Is Firing

The Virginia Supreme Court of Appeals holds that it is the duty of a fireman primarily to fire his engine, and the railroad cannot be charged with negligence for his failure to keep a lookout at a time when his duties require him to be firing.—*Director-General v. Hubbard's Admr. (Va.)* 111 S. E. 446.

Terminal Carrier Not Liable for

Initial Carrier's Negligence

The North Carolina Supreme Court holds that under a bill of lading covering shipment from New York to Asheville, providing that no carrier shall be liable for loss or damage not occurring on its own line, unless liability is imposed by law, the initial carrier was not the agent of the connecting roads so as to make the delivering carrier liable for the initial carrier's negligence, in the absence of allegation and proof of partnership or special contract.—*M. V. Moore & Co. v. Southern (N. Car.)* 111 S. E. 166.

United States Supreme Court

Lessor of Railroad Not Liable for

Injuries During Federal Control

An employee of the Southern Railway was killed in March, 1919, while engaged in intrastate commerce on a line in North Carolina held by the Southern under a 99-year lease from the North Carolina Railroad Company. Action was brought in the State court against the lessor company, its liability being asserted under a local rule by which a railroad corporation is liable for injuries resulting from a lessee's negligence in operation. The defendant set up the fact that the Southern system was being operated solely by the Director-General of Railroads under the Federal Control Act. The State court, however, instructed the jury that, if the Government was operating the railroad, it was doing so in the capacity of a lessee and that the defendant "would still be responsible for the acts and conduct of the Government * * *". Verdict and judgment for plaintiff were affirmed by the State Supreme Court without opinion.

The Supreme Court of the United States holds that the Government operated this railroad not as lessee, but under a right in the nature of eminent domain; it operated through the Director-General and to entertain this suit would be inconsistent with the Federal Control Act.—*North Carolina Railroad Co. v. Lee*. Decided October 16, 1922. Opinion by Mr. Justice Brandeis.

Foreign Railway News

Second Simplon Tunnel Opened

The second, or parallel, tube of the Simplon Tunnel, the largest in the world, has been completed, according to press dispatches from Geneva, Switzerland. This will make possible the double track operation of the Simplon line, which handles a heavy international passenger traffic. Both tubes of the tunnel are electrified.

Suit Against Mexican National

The Oliver American Trading Company has brought suit against the Mexican government and the National Railways of Mexico in the state supreme court at Rockland County, New York, seeking to recover \$1,250,000 which it alleges it lost when the railway "endeavored to repudiate its arrangements" with the company.

The Oliver company at one time operated trains over the lines of the Mexican National and it alleges that the railway violated a contract in stopping this practice and that, furthermore, engines and cars belonging to the company were confiscated.

British Concern to Build Locomotives in India

LONDON.

A group of influential Indian gentlemen, early in the year 1921, invited Kerr, Stuart & Company, Ltd., of Stoke-on-Trent, England, to form a company in India for the purpose of building railway locomotives. In their annual report submitted to the shareholders, the directors of the company state that they have decided to accept this invitation after having fully considered and investigated the position. An undertaking known as the Peninsular Locomotive Company has been formed, the capital having been subscribed privately in India. The production of locomotives on an extensive scale is expected to begin shortly.

To Install Automatic Signals on

the New Zealand Railways

The New Zealand Government Railways are planning to equip the new line connecting Otira and Arthur's Pass on the South island with automatic signals and two interlockers. The proposed installation is the result of a connecting line being constructed between the two terminals of the Midland railway division of the Government railways at Arthur's Pass in the Southern Alps. Owing to the mountainous country the railway terminated on each side of the pass and passengers and freight had to be conveyed between the two rail heads by means of stage-coaches and trucks. The construction of a tunnel has been completed between Otira and Arthur's Pass, a distance of 5.25 miles on a grade of 1 in 33, and will be opened for ordinary traffic early next year.

It was decided that a power interlocking frame should be installed at each of these stations and Messrs. McKenzie and Holland, Ltd., Australasian representatives of the Westinghouse Brake & Saxby Signal Co., Ltd., London, were given the contract of supplying two 19-lever electric power interlocking frames and the necessary signaling material for single line operation. The Midland railway connects Christchurch on the East side of the island with Greymouth on the West; between Christchurch and Rolleston, and Greymouth and Singleton there is double track, and between Rolleston and Singleton, a distance of 121 miles, it is single track on 3-ft. 6-in. gage. The government decided to equip the single track with automatic signals and gave a further contract to Messrs. McKenzie and Holland, Ltd., for 166 three-position color-light signals and other necessary material. The absolute permissive block system has been adopted with normal danger starting signals. The "vane" type of relay will also be used, both single and double-element classes to be installed. The transmission will be a. c. single phase, 3,300-volts at 50 cycles and step-down transformers will reduce this pressure to 100-volts for signal operation.

Equipment and Supplies

Locomotives

THE ILLINOIS CENTRAL is inquiring for about 75 locomotives.

THE MINNEAPOLIS & ST. LOUIS contemplates the purchase of from 25 to 30 locomotives.

THE TENNESSEE CENTRAL contemplates buying 4 Mountain type or Pacific type locomotives.

THE INTERNATIONAL & GREAT NORTHERN is said to be considering the purchase of some locomotives.

THE GREAT NORTHERN is said to be preparing to issue an inquiry for 50 or more locomotives of various types.

THE MAINE CENTRAL, reported in the *Railway Age* of September 23 as inquiring for 12 locomotives, has ordered eight 4-6-0 type locomotives from the Lima Locomotive Works.

THE CHICAGO, MILWAUKEE & ST. PAUL, reported in the *Railway Age* of October 21 as inquiring for 50 Mikado type locomotives, has increased this inquiry to 100 Mikado type locomotives.

Freight Cars

THE NORTHERN PACIFIC is inquiring for 3,000 box cars.

THE NORTHERN PACIFIC is inquiring for from 300 to 500 gondola cars.

THE LIVE POULTRY TRANSIT COMPANY, Chicago, will build 100 poultry cars in its own shops.

THE CHICAGO, MILWAUKEE & ST. PAUL is inquiring for 3,000 gondola cars, 1,500 box cars and 500 automobile cars.

THE KINGAN REFRIGERATOR LINE, Indianapolis, Ind., contemplates coming in the market for 100 refrigerator cars.

THE BEAUMONT EXPORT & IMPORT Co., Beaumont, Texas, is inquiring for 40 refrigerator cars for export to Mexico.

THE LOUISVILLE & NASHVILLE is inquiring for 2,000 steel hopper cars of 55 tons' capacity and 1,000 box cars of 40 tons' capacity.

THE WESTERN PACIFIC is inquiring for 800 general service gondola cars of 70 tons' capacity and 500 stock cars of 50 tons' capacity.

THE LEHIGH & NEW ENGLAND, reported in the *Railway Age* of July 29 as inquiring for 100 gondola cars of 50 tons' capacity, has ordered this equipment from the Magor Car Corporation.

THE PERE MARQUETTE is inquiring for 500 composite gondola cars of 50 tons' capacity. As reported in the *Railway Age* of October 21, this road is also inquiring for 1,500 box and 500 hopper cars.

FRUIT GROWERS EXPRESS.—The report in the *Railway Age* of October 14 that this company ordered 1,000 steel underframes from the American Car & Foundry Company is in error, as this equipment was ordered from the General American Car Company.

THE MAINE CENTRAL, reported in the *Railway Age* of September 30 as inquiring for 560 cars of miscellaneous types, has ordered 350 single-sheathed box and 100 open rack cars of 40-tons' capacity, 10 dairy products cars from the Keith Car & Manufacturing Company, and 50 all steel self clearing gondola cars of 50-tons' capacity from the Standard Steel Car Company.

Passenger Cars

THE CHICAGO, ROCK ISLAND & PACIFIC has awarded a contract to the Pullman Company for repairs to 5 dining cars.

THE MAINE CENTRAL, reported in the *Railway Age* of September 30 as inquiring for 7 steel combination baggage and mail cars, has ordered this equipment from the Osgood Bradley Car Company.

Iron and Steel

THE BALTIMORE & OHIO has ordered 2,500 tons of bridge steel from the McClintic-Marshall Company.

THE NEW YORK CENTRAL, reported in the *Railway Age* of September 30 as inquiring for 600 tons of steel for bridges at various places, has ordered this tonnage from the McClintic-Marshall Company.

Track Specialties

THE PENNSYLVANIA has issued an inquiry for 100,000 tie plates for its western lines.

Machinery and Tools

THE GRAND TRUNK has ordered two 72-in. spring formers from Joseph T. Ryerson & Son.

THE CHICAGO & NORTH WESTERN is soon expected to issue an extensive machine tool inquiry.

THE SOUTHERN RAILWAY is inquiring for a 32-in. shaper, a 16-in. portable engine lathe and a 36-in. planer.

THE CHICAGO, BURLINGTON & QUINCY has issued a new machine tool inquiry for its reclamation yard near Aurora, Ill.

THE ATLANTIC COAST LINE has ordered a 60-in. planer and a 6-spindle multiple drill from the Niles-Bement-Pond Company.

THE NEW YORK CENTRAL has ordered a car wheel lathe and one or two engine lathes from the Niles-Bement-Pond Company.

THE CRUCIBLE STEEL COMPANY has ordered from Joseph T. Ryerson & Son an equipment for the repairing of locomotive boiler tubes, to be installed at its shops at Harrison, N. J.

THE BALDWIN LOCOMOTIVE WORKS, reported in the *Railway Age* of September 30 as inquiring for a number of machine tools, has ordered two triple-end frame slotters and several frame planers from the Niles-Bement-Pond Company.

THE PENNSYLVANIA, reported in the *Railway Age* of September 30 as inquiring for a number of overhead traveling cranes, has ordered from the Niles-Bement-Pond Company two cranes of 250 tons' capacity, two of 60 tons', two of 25 tons' and 10 of 15 tons' capacity. A list of heavy machine tool requirements has been issued by this company. These include: Three No. 5 knee type milling machines; 17 engine lathes with 16-in. to 48-in. swing; six, 36-in. and three, 42-in. vertical turret lathes; two, 36-in. and two, 48-in. planers; two, 90-in. driving wheel lathes; three, 5-ft. and one, 6-ft. radial drills; four horizontal turret lathes; five, 24-in. shapers; two, 15-in. and three, 18-in. slotters; ten, 36 in. by 4 in. wet emery grinders; three turret lathes, an axle lathe; journal-turning lathe; 42-in. coach wheel lathe; 90-in. tire mill; 2-in. pipe machine; crown and staybolt threading and reducing machine, 6 spindles; bolt turning machine, 4 spindles; bolt pointing machine and bolt heading machine.

Miscellaneous

THE NEW YORK CENTRAL will receive bids until 12 o'clock noon November 6, for a number of oil storage barges.

THE NEW YORK CENTRAL is having 25 electric motor trucks built at the shops of the Standard Steel Car Company. These trucks are for use on 600-volt d. c. cars.

THE GREAT NORTHERN is inquiring for one, 65,000 gal. steel oil tank with 30 ft. steel tower for Troy, Mont.; one, 10,000 barrel steel oil tank and one, 65,000 gal. steel oil tank with 30 ft. steel tower for Whitefish, Mont.

THE SOUTHERN PACIFIC, during the past 10 years, has distributed more than 80,000,000 pieces of literature exploiting the agricultural, scenic and industrial resources of the territory served by its lines, at a cost of more than \$5,500,000. Leaflets and pamphlets are frequently issued to 14,000 coupon ticket agents of other railroads in the United States and Canada.

Supply Trade News

R. S. Dean has been appointed district sales manager of the machinery and crane departments of **Manning, Maxwell & Moore, Inc.**, Chicago district. His headquarters will be in that city.

S. G. Johnson, president of the Johnson Railway Supply Corporation, New York, has been appointed sales representative of the **Magnetic Signal Company**, Los Angeles, Cal., for the territory east of Pittsburgh, with headquarters at 30 Church street, New York.

Dwight P. Robinson & Company, Incorporated, New York, has been awarded a contract for the construction of a cement mill at Birmingham, Ala., for the Lehigh Portland Cement Company, Allentown, Pa. The mill will have a capacity of 1,000,000 barrels a year.

Trade Publications

WAR SURPLUS.—This is the title of a little booklet issued by the Sales Promotion Section of the Office of the Director of Sales. It describes in a general way the methods of sale resorted to by the War Department in the disposal of its vast stocks of surplus property and tells what these stocks contain at the present time.

The Gap Crane.—The H. K. Ferguson Company, Cleveland, Ohio, has issued a four-page leaflet illustrating the adaptation of the gap crane to an erecting shop for the handling of heavy locomotive repairs as worked out for the Hornell (N. Y.) shop of the Erie now under construction. This leaflet shows the manner of handling locomotives with this crane and points out the advantages of this new equipment.

TIMBER STATEMENT.—The Century Wood Preserving Company, Pittsburgh, Pa., has published timber bulletin No. 24, which is devoted to the consideration of treated timber for flooring and pavements, poles, cross arms, fencing, bins, sheds, platforms, walks, trestles and similar industrial uses. The bulletin is well illustrated and contains data on the proper piling of ties, as well as tables showing the amount of preservatives required for cross-ties, poles and piling.

HOLT ROOF LEADER AND VENT CONNECTIONS.—This 28-page booklet recently issued by the Barrett Company, New York, is descriptive of the eight types of Holt roof connections manufactured by this company. The different types are discussed in relation to their use in flat roof and saw-tooth construction and in places where vent pipes, leader lines, steam stacks, etc., passing through a roof, require flashings. The illustrations show by photographs and drawings actual installations and the way in which they are made.



International

An Accident at Montalvo, Cal.

Railway Construction

BALTIMORE & OHIO.—This company has placed a contract with McClintic-Marshall Company for the fabrication of approximately 2,500 tons of structural steel required in connection with its program for bridge renewals during the 1923 working season. The bridges in question are of various types, including "I" beam spans, deck and through plate girders. The contract also includes new steelwork required in connection with the remodeling of second-hand girders in the railroad company's stock for use at new locations. Delivery is to be made March 15, 1923, and it is the intention to prosecute the erection vigorously as soon as the steelwork reaches the respective bridge sites and the weather conditions become favorable.

CHICAGO & NORTH WESTERN.—This company has been ordered by the Board of Railroad Commissions of the state of South Dakota to construct a station not less than 16 ft. by 24 ft. at Oral, S. D.

LOS ANGELES & SALT LAKE.—The Interstate Commerce Commission has authorized the construction of a branch line from a connection with its main line at Lund, Utah, in a southeasterly direction to Cedar City, 32 miles.

MISSOURI, KANSAS & TEXAS.—This company has awarded a contract to James Stewart & Company, Chicago, for the construction of a grain elevator of 1,000,000 bushel capacity at Glen Parks Yard, Kansas City, Mo.

MISSOURI PACIFIC.—This company has awarded a contract to the Ogle Construction Company, Chicago, for the construction of a 300-ton reinforced concrete coaling station at Bald Knob, Ark.

NEW YORK, NEW HAVEN & HARTFORD.—This company will construct a half-through girder bridge carrying six tracks over the proposed Capitol avenue extension, at Hartford, Conn. The bridge will be three spans, giving a clear roadway width of forty feet with two sidewalks, ten feet each, with supports on the curb lines.

PENNSYLVANIA.—This company has awarded a contract to H. F. Curtis, Philadelphia, for an eastbound gravity hump yard at its West Morrisville, N. J., yards.

TEXAS & PACIFIC.—This company will construct a 100 ft. turntable and a three stall extension to its roundhouse at El Paso, Tex.

THE LOUISVILLE & NASHVILLE announces that an agreement on wages and working conditions has been reached in conferences between officers of the road and representatives of the new association of shopmen, which has been formed on that road. This association is said to have about 13,000 members. The agreement provides for a working day of eight hours for skilled labor and one of ten hours for unskilled. No provision is made for an extra rate of pay for work on Sundays or holidays.

EMPLOYEES OF THE Long Island Railroad who have been in the service of the road over 20 years are forming a Veteran Employees' Association, and plan to have a dinner in New York City on November 18. About 1200 men are eligible to membership, and large numbers have joined already. President Ralph Peters was one of the first to join. C. D. Baker, general superintendent, will act as chairman at the organization meeting on November 18, when the officers and board of governors will be elected. The temporary committee is made up of F. W. Nichols, auditor of revenue; W. E. Wilkins, chief clerk to superintendent of motive power; H. E. Lewis, train master; J. W. O'Loughlin, supervisor or signalman; Samuel E. Booth, retired engineer; H. L. Merker, baggage trace clerk, baggage department; N. L. Barton, passenger conductor; H. M. Ashmead, engineman, and R. G. Richardson, secretary to the president.

Railway Financial News

CHICAGO & NORTH WESTERN.—Stock Offered.—Kidder, Peabody & Co. and Salomon Brothers & Hutzler are offering a limited amount of preferred stock of this company at prices to yield about 5.65 per cent, based upon its present dividend rate of 7 per cent per annum. Dividends are payable semi-annually, January 15 and July 15, and the stock is free from normal federal income tax. The preferred stock is entitled to preference as to dividends to the aggregate amount of 10 per cent out of the net earnings for any one year, in the following manner: First, to a preference of 7 per cent and after dividends of 7 per cent on the common stock, to a further preference of 3 per cent. After a further dividend of 3 per cent on the common stock, both classes of stock shall be entitled to equal rates per share on any further dividends.

CHICAGO, ROCK ISLAND & PACIFIC.—Partial Payment of Guaranty.—The Interstate Commerce Commission has certified a partial payment of \$1,000,000 on account of this company's guaranty for 1920.

COLORADO SPRINGS & CRIPPLE CREEK DISTRICT.—Sold.—This railway, extending from Colorado Springs, Colo., to Cripple Creek, Colo., 71 miles, was sold on October 16 to W. D. Corley, of Colorado Springs, for \$375,000, to satisfy a judgment obtained against it by the Guaranty and Union Trust Companies of New York City.

DENVER & RIO GRANDE.—Holland Bank a Sub-depositary.—The Sutro committee, headed by Richard Sutro, and including Lewis L. Clarke, President of the American Exchange National Bank, and William Loeb, Jr., which has asked for the deposit of Denver & Rio Grande first and refunding 5 per cent bonds, has appointed the Rotterdamsche Bankereeniging of Amsterdam as a sub-depositary for these bonds, a large amount of which are held in Holland.

ILLINOIS CENTRAL.—Asks Authority to Issue Bonds.—This company has applied to the Interstate Commerce Commission for authority to issue \$968,000 of refunding mortgage 4 per cent gold bonds to refund some first mortgage bonds which mature on August 1, 1921.

INTERNATIONAL-GREAT NORTHERN.—Reorganization Plan Approved.—The Interstate Commerce Commission has authorized the proposed issuance of securities and other transactions involved in the proposed plan of reorganization of the International & Great Northern by the International-Great Northern Railroad Company. The commission has issued a certificate that public convenience and necessity require the acquisition and operation by the applicant of the lines formerly belonging to the International & Great Northern, and the acquisition of trackage rights over the Galveston, Houston & Henderson between Houston and Galveston, Texas, the acquisition of control of the Austin Dam & Suburban by the acquisition of all of its stock and the acquisition of 50 per cent of the stock of the Galveston, Houston & Henderson. Authority was also granted to issue \$20,000,000 of first mortgage, 30-year, 6 per cent gold bonds, of which \$2,750,000 was to be pledged with the director general of railroads, \$17,000,000 of adjustment mortgage, 30-year, 6 per cent gold bonds and \$7,500,000 of common stock. The commission held that its authority was not necessary for the issue of the proposed note or notes to the director general in respect of additions and betterments during the period of federal control. Details of the reorganization plan were given in the *Railway Age* of June 3, page 1312.

The commission's report contains the following additional details:

It appears that the earnings of the International & Great Northern have shown improvement during 1922 as compared with the earnings of the past few years. During the first eight months of 1922, the net railway operating income was little short of eight months' actual fixed charges on basis of the proposed capitalization, notwithstanding the recent strike. The applicant estimates, on basis of apparently normal increases in traffic and revenues, and reduced prices of fuel and other supplies, decreased wages and increased economies in operation, that the net income available for

interest for 1922, 1923, 1924 and 1925, will be \$2,497,018, \$3,031,512, \$3,178,135 and \$3,326,821, respectively.

It appears further, that as of June 30, 1922, the investment in road and equipment, less accrued depreciation on equipment, was \$41,406,847. The applicant will acquire approximately \$2,000,000 in materials and supplies and will also acquire \$4,000,000 in cash in the reorganization. These amounts added to the net book investment of \$41,406,847 will make a total of \$47,406,847, which excess will be increased by such amounts as may be determined as representing the value of \$500,000 capital stock of the Galveston, Houston & Henderson, and \$100,000 capital stock of the Austin Dam & Suburban, to be acquired. The total capitalization proposed, \$44,150,000, seems to be reasonable when compared with the book assets of the new company, aggregating over \$47,406,847.

We have not yet established the final valuation of the properties involved in the reorganization. It is, therefore, impracticable to compare the proposed capitalization with the underlying value. It appears, however, that the fixed charges will be materially reduced, with a consequent improvement in credit. The evidence also indicates that the new capitalization will not be disproportionate to the prospective earning power of the applicant. Under these circumstances, in view of the manifest desirability of ending the long period of receivership, we think that the proposed capitalization should be approved.

LEHIGH & HUDSON RIVER.—Guaranty Certified.—The Interstate Commerce Commission has certified the amount of this company's guaranty for the six-months period following federal control as \$384,750, of which \$184,750 was still to be paid to the company.

MACON & BIRMINGHAM.—Service May Be Stopped.—A hearing will be held in the courthouse at Macon, Ga., on October 28, so that interested persons will have an opportunity to present their views as to a reasonable expectation of continued service on this line. Passenger service on the road was discontinued October 11. J. E. Hall, attorney for the road, said that the entire system had suffered financial losses annually of such magnitude that continuance of regular normal railroad service was out of the question. He added that automobiles and motor trucks have burrowed deeply into the freight and passenger traffic that the short line railroad used to get.

The Transportation Department of the Macon Chamber of Commerce is working on possible ways of keeping the road in operation. It is said that 200,000 peach trees with an estimated average output annually of \$3 per tree would show a loss of \$600,000 to the farmers along the road, if service were to be stopped. The melon crop would also be practically a total loss. Large timber holdings and about 20 sawmills are dependent on the line for transportation.

MADISON SOUTHERN.—Asks Authority to Abandon Line.—This company has applied to the Interstate Commerce Commission for authority to abandon the operation of its line of 6.7 miles, in Madison county, Florida.

MARSHALL & EAST TEXAS.—Application for Authority to Dismantle.—The United States Court for the Eastern District of Texas at Texarkana, Tex., will hold a hearing November 11 on the application of Bryan Snyder, receiver of the Marshall & East Texas for authority to dismantle the remaining property of the railway between Gilmer and East Winnsboro for the benefit of its creditors.

MINNEAPOLIS & ST. LOUIS.—Asks Authority for Equipment Trust.—This company has applied to the Interstate Commerce Commission for authority to issue \$1,500,000 of 10-year, 5½ per cent equipment trust certificates to be sold at 95½.

MISSOURI PACIFIC.—Bonds Sold.—Kuhn, Loeb & Co. have sold at par and interest \$5,500,000 first and refunding mortgage 6 per cent gold bonds, series "D," due February 1, 1949, similar to bonds of series "D" at present outstanding. The purpose of this issue is to reimburse the company for capital expenditures and to provide funds needed in payment for the purchase of new equipment.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—Bonds Sold.—J. P. Morgan & Co. have sold \$1,800,000 4½ per cent one to 15-year equipment bonds at prices to yield 4.90 per cent.

NEW YORK CENTRAL.—Asks Authority for Equipment Trust.—The New York Central, the Michigan Central and the Cleveland, Cincinnati, Chicago & St. Louis have filed a joint application with the Interstate Commerce Commission for authority for the issuance of \$12,660,000 of New York Central Lines 4½ per cent equipment trust certificates to be issued by the Guaranty Trust Company. The application states that the companies are in negotiation with

J. P. Morgan & Co. and it is expected to sell the certificates at 95 or on a net basis of 53.

NORFOLK & WESTERN.—Declares Extra Dividend.—The directors have declared the regular quarterly dividend of \$1.75 on the common stock and an extra dividend of \$1 per share. The road has paid 7 per cent annually on the common stock regularly since 1918. The extra dividend on the common is the first since 1917, when the road paid a total of 8 per cent for the year, 1 per cent extra being paid on March 19, 1917.

NORTHERN PACIFIC.—New Director.—Theodore F. Merseles of Chicago has been elected a director to fill an existing vacancy.

PENNSYLVANIA.—Restores 6 Per Cent Dividend Rate.—The directors have declared a quarterly dividend of 1½ per cent, payable November 29 to stock of record November 1. Since May, 1921, the quarterly dividend paid has been 1 per cent, having then been reduced from the long established rate of 6 per cent per annum. Until last year the Pennsylvania had not paid less than 6 per cent since 1900. The stock closed at 49½ on Wednesday.

The declaration of a quarterly dividend of 1½ per cent by the Pennsylvania, restoring the stock to a 6 per cent annual basis, was followed by an advance in the stock to the high price of the year and the highest price since 1918.

ST. LOUIS-SAN FRANCISCO.—Equipment Trust Authorized.—The Interstate Commerce Commission has authorized an issue of \$6,000,000 of equipment trust certificates by the Guaranty Trust Company of New York to be sold at not less than 96.

SEABOARD AIR LINE.—Equipment Trust Authorized.—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of \$2,560,000 of equipment trust certificates to be issued by the Chase National Bank, at not less than 96.63.

SOUTH GEORGIA.—Asks Authority to Issue Stock.—This company has applied to the Interstate Commerce Commission for authority to increase its common stock from \$58,000 to \$495,500 for the purpose in part of purchasing the West Coast Railway for \$205,500. It is also proposed to issue \$250,000 of preferred stock to liquidate the company's bonded indebtedness.

SUPERIOR & SOUTHEASTERN.—Asks Authority to Abandon Line.—This company has applied to the Interstate Commerce Commission for authority to abandon the operation of that part of its line extending southeast from Grandview, Wisconsin, 11.8 miles.

Railroad Administration Settlements

The United States Railroad Administration reports the following final settlements, and has paid out to the several companies the following amounts:

| | |
|--|-------------|
| Chicago Great Western Railroad Company..... | \$1,600,000 |
| Galena-Signal Oil Company..... | 150,000 |
| Atlanta, Birmingham & Atlantic Railway Co..... | 1 |
| SHORT LINES | |
| Frankfort & Cincinnati Railway Co..... | 1 |

Dividends Declared

Delaware & Hudson.—2¼ per cent, quarterly, payable December 20 to holders of record November 27.

Illinois Central.—Common, 1¼ per cent, quarterly, payable December 1 to holders of record November 3.

Norfolk & Western.—Common, 1¼ per cent, quarterly, and 1 per cent, extra, both payable December 19 to holders of record November 29.

Pennsylvania.—1¼ per cent, quarterly, payable November 29 to holders of record November 1.

Pullman Company.—\$2.00, payable November 15 to holders of record October 31.

Reading Company.—First preferred, 1 per cent, quarterly, payable December 14, to holders of record November 28.

Trend of Railway Stock and Bond Prices

| | Oct. 24 | Last Week | Last Year |
|---|---------|-----------|-----------|
| Average price of 20 representative railway stocks | 72.40 | 73.63 | 55.23 |
| Average price of 20 representative railway bonds | 87.13 | 87.85 | 76.43 |

Railway Officers

Executive

Thomas L. Handy has been elected president of the Port Huron & Detroit with headquarters at Bay City, Mich. **C. W. Handy** has been elected vice-president.

John G. Walber, executive secretary of the Bureau of Information of the Eastern Railways with headquarters at New York, has resigned this position to become vice-president in charge of personnel of the New York Central System, effective November 1.

Financial, Legal and Accounting

O. W. Dynes, general attorney of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, has been promoted to general solicitor, with the same headquarters, succeeding

H. H. Fields, promoted. He was born in Columbus, Wis., and studied law at Cornell University. After being admitted to the bar in 1895, he aided in the first revision of the Starr & Curtis revised statutes of Illinois, and from 1897 to 1908, he was trial attorney with the Fidelity & Casualty Company, and was engaged in general corporation practice. In the latter year he entered railway service as assistant general solicitor of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, which position he



O. W. Dynes

held until 1912, when he was promoted to commerce counsel. In 1918, he was promoted to general attorney and has held this position until his recent promotion to general solicitor.

C. S. Jefferson, assistant general solicitor of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, has been promoted to general attorney, succeeding O. W. Dynes,

promoted. Mr. Jefferson was born on Aug. 31, 1876, at Madison, Wis., and graduated from the University of Wisconsin Law School in 1896. Two years later he entered railway service as a law clerk in the office of the Chicago, Milwaukee & St. Paul at Chicago. He held this position until 1900, when he was promoted to attorney, which position he held until 1910, when he was appointed assistant general solicitor. During the war he served as judge advocate in the United States army, and at the termination of his



C. S. Jefferson

service he returned to his former position with the Chicago, Milwaukee & St. Paul, which position he held until his recent promotion to general attorney.

J. N. Davis, solicitor of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, has been promoted to commerce counsel, with the same headquarters.

Leo. C. Van Laan has been appointed auditor of the Port Huron & Detroit with headquarters at Bay City, Mich. Mr. Van Laan is also assistant secretary of the company. **G. W. Handy** has been elected treasurer and **Helen M. Handy** secretary. **A. C. McDannel** is assistant treasurer.

H. H. Field, general solicitor of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, has been promoted to general counsel, with the same headquarters. He was born on May 17, 1857, at Leverett, Mass., and entered railway service on September 24, 1880, as an attorney with the Chicago, Milwaukee & St. Paul at Milwaukee, Wis. He was appointed assistant general solicitor in 1887. From November, 1905, to January 1, 1912, he was general counsel of the Chicago, Milwaukee & Puget Sound at Seattle, Wash. On the latter date he was promoted to general solicitor of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, which position he has held until his recent promotion to general counsel.

Operating

G. C. MacDonald has been appointed trainmaster of the Michigan Central with headquarters at Bay City, Mich.

L. F. Donald, chief clerk to the assistant general manager of the Chicago, Milwaukee & St. Paul at Chicago, has been promoted to trainmaster, with headquarters at Bensenville, Ill.

G. L. Whipple, superintendent of transportation of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, has been promoted to general superintendent of transportation with the same headquarters.

F. D. Keeler, acting assistant chief clerk to the General Superintendent of the Pere Marquette with headquarters at Detroit, has been promoted to assistant superintendent of car service with the same headquarters.

A. C. McDannel has been appointed general manager of the Port Huron & Detroit, with headquarters at Bay City, Mich. **F. E. Pinkerton** has been appointed superintendent of car service and **G. H. Greenway** has been appointed superintendent.

Traffic

H. L. Toland has been appointed general agent of the Graysonia, Nashville & Ashdown with headquarters at Ashdown, Ark.

F. D. Gouldburg has been appointed general freight and passenger agent of the Port Huron & Detroit with headquarters at Bay City, Mich.

F. McD. Quinn has been appointed assistant general passenger agent of the Central region of the Pennsylvania, succeeding **Roy L. Stall**, deceased.

J. X. Kinberger has been appointed commercial agent of the Chicago & Alton with headquarters at St. Louis, Mo., succeeding **C. F. White**, resigned.

W. A. Lowe has been appointed district freight agent of the Canadian Pacific with headquarters at Fort William, Ont., succeeding **J. J. Weegar**, transferred.

F. S. Griffin has been appointed division freight agent of the Louisville & Nashville with headquarters at Pensacola, Fla., succeeding **W. C. Dillard**, transferred.

J. H. Fox has been appointed district freight agent of the Canadian Pacific with headquarters at Vancouver, B. C., succeeding **A. J. Cambie**, on leave of absence.

T. O. Jennings, freight traffic manager of the Chicago & Eastern Illinois with headquarters at Chicago, has been promoted to traffic manager with the same headquarters.

E. A. Montgomery, has been appointed general agent of the Mississippi Central and the Louisiana & Arkansas, with headquarters at New Orleans, succeeding **J. D. Youman**, resigned.

A. E. Enoch has been appointed assistant general freight and passenger agent of the Lehigh & New England with headquarters at Bethlehem, Pa., succeeding **Richard Macsherry**, resigned.

G. D. Williams, formerly of the Nashville, Chattanooga & St. Louis, has been appointed general agent of the traffic department of the Chicago, North Shore & Milwaukee, with headquarters at Chicago.

G. H. Griffin, city passenger agent of the Canadian Pacific, with headquarters at St. Louis, Mo., has been promoted to general agent, passenger department and steamship lines, with headquarters at Cleveland, Ohio.

J. Webster, assistant traffic manager of the New York Central with headquarters at Chicago, has had his jurisdiction extended over the recently leased Toledo & Ohio, Kanawha & Michigan, Kanawha & West Virginia and Zanesville & Western.

F. E. Jones has been appointed general agent of the Kansas City, Mexico & Orient with headquarters at St. Louis, Mo., succeeding **G. W. Neudling**, resigned. **J. J. Lane** has been appointed assistant general freight agent with headquarters at Wichita, Kan.

Mechanical

J. A. Buechler has been appointed master mechanic of the Port Huron & Detroit with headquarters at Bay City, Mich.

F. A. Torrey, general superintendent of motive power of the Chicago, Burlington & Quincy, with headquarters at Chicago, will retire on November 1.

A. W. Novak, district boiler inspector of the Chicago, Milwaukee & St. Paul, with headquarters at Minneapolis, Minn., has been promoted to general boiler inspector succeeding **E. W. Young**, assigned to other duties.

W. J. O'Brien, master mechanic of the Kanawha & Michigan, with headquarters at Middleport, Ohio, has been appointed master mechanic of the Toledo & Ohio Central, with headquarters at Bucyrus, Ohio, succeeding **C. Bowersox**, who has resigned to engage in other business.

J. E. Friend, assistant master mechanic of the Fort Worth division of the Texas & Pacific, with headquarters at Marshall, Tex., has been promoted to master mechanic of the Louisiana division, with headquarters at Alexandria, La. He will be succeeded by **D. L. Ringer**, general foreman at Baird, Tex.

Engineering, Maintenance of Way and Signaling

W. N. Boyd has been appointed chief engineer of the Port Huron & Detroit with headquarters at Bay City, Mich.

Purchasing and Stores

J. D. McCarthy, purchasing agent of the Minneapolis & St. Louis with headquarters at Minneapolis, Minn., has been promoted to general purchasing agent in charge of purchases and stores of the Minneapolis & St. Louis, the Railway Transfer Company of the City of Minneapolis and the Hocking Coal Company.

Special

M. Welch, chief special agent of the Seaboard Air Line, has resigned to accept a similar position on the Chesapeake & Ohio, with headquarters at Richmond, Va.

Obituary

A. F. Vick Roy, superintendent of the Union Pacific with headquarters at Denver, Colo., died on October 17.